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Strategic Analysis and Associated Management Products Supporting the Reengineering of Bayne-Jones Army Community Hospital:

Consultative Products and Findings

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In support of strategic reengineering of Bayne-Jones Army Community Hospital (BJACH), this consultative project provides a strategic analysis of the hospital, an overview of planned strategies of the hospital, and five management products based upon requirements identified in the strategic analysis and plans. These five products are listed below.
*Product 1 - "Bayne-Jones Outpatient Model," a strategic modeling simulation for determining the efficacy of business process reengineering efforts.
*Product 2 - "Bayne-Jones Army Community Hospital Web Site," a strategic Internet web site for marketing health and wellness, the TRICARE medical network, the Joint Readiness Training Center Surgeon's Office, and command information.
*Product 3 - "The Patient Advocate," a 32-bit computer program (shared over the network) for tracking patient complaints and compliments.
*Product 4 - "The Morning Ritual," a 32-bit program for tracking morning report data (especially JRTC) provided to the Executive Council.
*Product 5 - "The Command Health Status Report," a 32-bit computer program for managing the Command Health Status (readiness) of units on Fort Polk.
Specific tools used to complete this project include: strategic planning, linear regression, analysis of variance, decomposition, distribution analysis, computer programming, web site construction and development, project flow charting, simulation, and virtual reality modeling.

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Thanks to all of the professional staff of Bayne-Jones Army Community Hospital.

Note: All management products referenced in this paper are available at http://www.polk.amedd.army.mil or http://bjach.polk.amedd.army.mil under the software link.

Abstract

In support of strategic reengineering of Bayne-Jones Army Community Hospital (BJACH), this consultative project provides a comprehensive strategic analysis, an overview of planned strategies, and six management products based upon requirements identified in the strategic analysis and plans. These six products include:

*Product 1 – "Bayne-Jones Outpatient Model," a strategic modeling simulation for determining the efficacy of the organization's business processes.

*Product 2 – "Bayne-Jones Army Community Hospital Web Site," a strategic Internet web site for marketing health and wellness, the TRICARE medical network, the Joint Readiness Training Center Surgeon's Office, and command information.

*Product 3-"The Internet Patient Appointment Scheduling System," a tool for scheduling well and routine appointments through the Internet.

*Product 4 – "The Patient Advocate," a 32-bit computer program (shared over the network) for tracking patient complaints and compliments.

*Product 5 – "The Morning Ritual," a 32-bit program for tracking morning report data (especially JRTC) provided to the Executive Council.

*Product 6 – "The Command Health Status Report," a 32-bit computer program for managing the Command Health Status (readiness) of units on Fort Polk.

Specific tools used to complete this project include: strategic planning, linear and non-linear regression, analysis of variance, decomposition, distribution analysis, computer programming, web site construction and development, project flow charting, simulation, and project management software.

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Preface

Bayne-Jones Army Community Hospital (BJACH) understands its position in the military medical marketplace. Managed care and the advent of Enrollment-Based Capitation (EBC) require the facility to reengineer both its structure and processes.

For BJACH, the reengineering is more than just superficial. The senior leaders are committed to change and are marketing their commitment both internally and externally at every opportunity. Changing the culture of the organization, however, is no easy task.

In support of the reengineering, this Graduate Management Project (GMP) provides strategic, operational, and tactical products. At the strategic level, the paper provides the foundation for the organizational reengineering. Through situational analysis and evaluation of the strategic mission, vision, values, and key performance areas, clear strategies emerge. At the operational level, this GMP provides plans and staffing actions for implementation of the organizational strategies. These plans include reorganization orders and coordination documents. Finally, this management paper offers six products, focused at the tactical level, for ensuring the implementation of operational plans.

During the development of this management project, the strategic plan has changed significantly and rapidly. Today, this paper reflects the "truth;" however, the best strategic plans rely on constant scanning of the external and internal situation. The truth is a moving target.

Chapter 1 – Introduction to Bayne-Jones Army Community Hospital

To understand any strategic reengineering effort, familiarity with the organization and the community is required. Chapter 1 provides this foundation.

About Bayne-Jones Army Community Hospital . . .

Bayne Jones Army Community Hospital (BJACH) located at Fort Polk, Louisiana, is a 52-bed military health care facility, which is capable of expanding to 168 beds upon mobilization (Table of Distribution and Allowance (TDA) MCW2NKAA-Effective Date 980601, 1997). The hospital is one of nine Medical Department Activities (MEDDACS) subordinate to the Great Plains Regional Medical Command (GPRMC) and provides the services depicted in Table 1.

Table 1. The table below depicts the services provided by BJACH (TDA, 1997).

Alcohol/Drug Detoxification	Nuclear Medicine
Anatomical Pathology	Obstetrics
Anesthesiology	Occupational Therapy
Audiology	Ophthalmology
Blood Donor Center	Optometry
Cardiology	Orthopedic Prosthetics
Clinical Pathology	Orthopedic Surgery
Clinical Psychology	Otorhinolaryngology
Dermatology	Pediatrics, Developmental
Electroencephalography	Pediatrics, General
Emergency Medicine	Physical Therapy
Family Practice	Podiatry
General Surgery	Preventive Medicine
Gynecology	Psychiatry, Adult
Hand Surgery	Same Day Surgery
Health Risk Appraisal	Social work
Industrial Hygiene	Speech Pathology
Internal Medicine	Speech Therapy
Musculoskeletal Evaluation	Support Services
Neurology	Urology

As part of the TRICARE military health care network, beneficiaries in Bayne-Jones Army Community Hospital 40-mile catchment area have access to a full-range of services not provided by BJACH. Table 2 depicts some of the more common services and their locations.

Table 2. The table below depicts some of the services provided by the TRICARE medical network and the location of these services (R. N. David, personal communication, July 1997).

Service	**Location**
Cardiology	Alexandria
Psychiatric inpatient	Alexandria
Neurology	Alexandria
Neurosurgery	Alexandria
Neonatology	Shreveport
Nuclear medicine	Alexandria
Oncology	Alexandria
Endocrinology	Alexandria
Hematology	Alexandria

The hospital facility itself consists of seven floors, although only six of them are usable for patient care as the third floor houses maintenance and facility systems. Nevertheless, the hospital has extra capacity. In addition to the basic structure, the hospital operates one Consolidated Troop Medical Clinic (CTMC or TMC), a separate outpatient clinic which treats only soldiers. The hospital capacity and the CTMC will both be important to the strategic analysis. Figure 1 is a picture of the hospital.

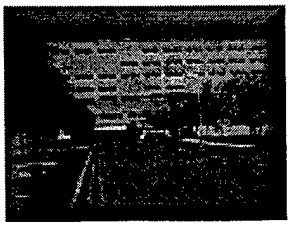


Figure 1. The BJACH facility is a modern, seven-floor structure.

The hospital organizational diagram is typical of many small facilities. The Deputy Commander for Administration (DCA) controls the administrative elements, while the Deputy Commander for Clinical Services (DCCS) manages the clinical departments and services. (The hospital nursing staff is a department underneath the Deputy Commander for Clinical Services.) The organization of the hospital will also affect the strategic analysis and plans. Figure 2 is the organizational diagram.

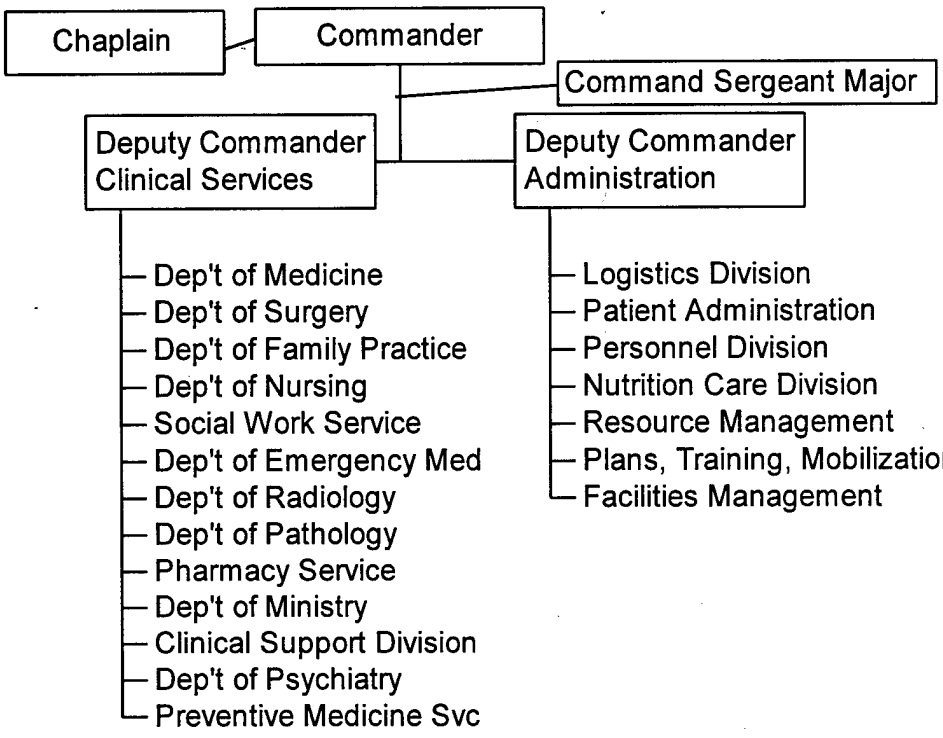


Figure 2. The BJACH organizational diagram is typical of many small facilities (TDA, 1997).

The hospital is the largest of three health care facilities in a 30-mile radius and is an essential community asset. The other two facilities, Byrd Memorial Hospital, a 70-bed facility located in Leesville, and Beauregard Memorial Hospital, a 102-bed facility located in DeRidder, provide fewer services (see Table 3) (American Hospital Directory

[On-Line], 1997). The strategic plans of these two organizations significantly influence BJACH's strategies.

Table 3. Byrd Regional and Beauregard Memorial Hospital provide the services listed. NOTE: Byrd Hospital provides no obstetrical care and Beauregard has limited capability for obstetrics.

Services provided by Byrd Hospital, Leesville	
Anesthesia	Optometry
Blood Bank	Outpatient Surgery Unit
Dietary	Physical Therapy
Emergency Services	Postoperative Recovery Room
Inpatient Surgical	Psychiatric
Intensive Care Unit	Radiology (Therapeutic)
Laboratory (Anatomical)	Self-Care Unit
Laboratory (Clinical)	Speech Pathology
Nuclear medicine	
Services provided by Beauregard Hospital, DeRidder	
Anesthesia	Optometry
Blood Bank	Outpatient Surgery Unit
Dietary	Pediatric
Home Care Unit	Pharmacy
Inpatient Surgical	Physical Therapy
Intensive Care Unit	Postoperative Recovery Room
Laboratory (Clinical)	Radiology (Therapeutic)
Neonatal Nursery	Self-Care Unit
Nuclear Medicine	Speech Pathology
Obstetrics	

About Fort Polk, Louisiana . . .

Fort Polk, the home of Bayne-Jones Army Community Hospital, is a geographically isolated, 198-thousand acre military installation located in the eastern portion of the state. The estimated annual impact of the installation on the community is $709 million. The installation supports approximately 89,614 military, civilian, and contract employees (Fort Polk Facts, [On-Line], 1997.) The isolation of Fort Polk is a

factor in BJACH's strategic planning. Figure 3 is a map of Fort Polk and the surrounding area.

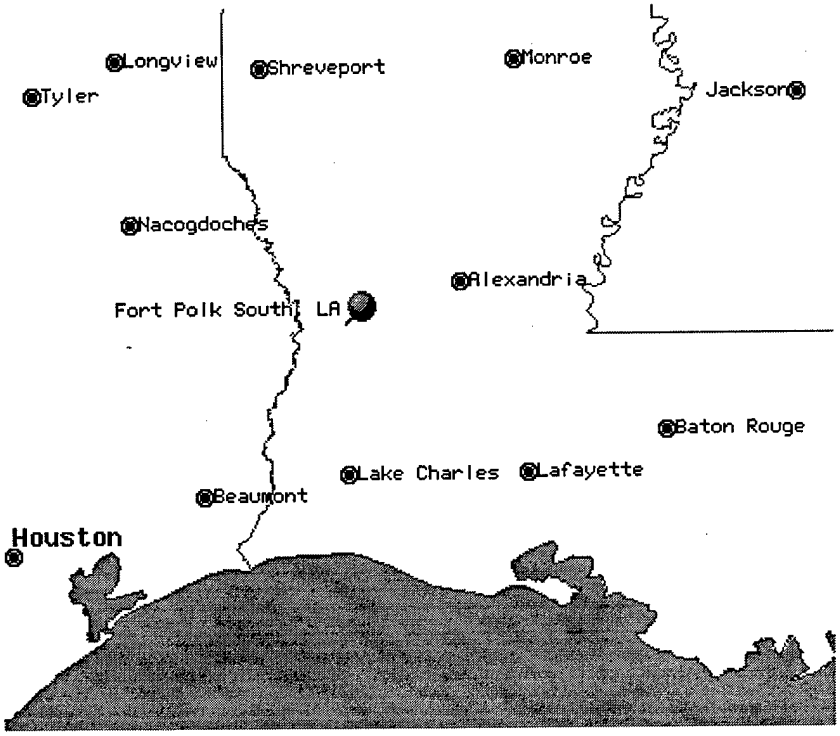


Figure 3. The map above depicts the location of Fort Polk in Louisiana. The largest cities in the vicinity are Alexandria to the northeast and Lake Charles to the south (Tiger Census Map Server [On-Line], 1997).

Fort Polk serves as the home to the Joint Readiness Training Center, an excellent training facility for light forces. The mission of JRTC is to "provide an advanced level of joint training for United States forces under tough, realistic conditions and mobilize, prepare, train and deploy units worldwide, while taking care of our soldiers, families, and civilian workforce." (JRTC and Fort Polk Home Page, [On-Line], 1997.) The JRTC mission also significantly affects BJACH's strategies.

The Fort Polk installation serves as the home of several deployable and non-deployable units (See Figure 4). The installation recently assisted the 2d Armored

Cavalry Regiment (ACR) deployment to Bosnia and the 115th Field Hospital deployment to Operation Bright Star. Again, the operational tempo of these units affects BJACH's strategic planning.

Figure 4. The primary units supported by BJACH consist of about 8,000 soldiers.

What BJACH Does . . .

After familiarization with BJACH, the local community, and Fort Polk, a discussion of the hospital's basic responsibilities is necessary to establish the groundwork for the strategic analysis.

Bayne-Jones Army Community Hospital has three primary responsibilities: support of beneficiaries, support of readiness, and support of the Joint Readiness Training Center and Fort Polk (C.W. Fox, personal communication, August 1997). Each one of these responsibilities stems from a different source and requires separate evaluation; however, they all parallel the Army Surgeon General's (Lieutenant General Ronald R. Blanck) goals for medicine. "We deploy a healthy force, we deploy a medical force, and we manage the care of all of our beneficiaries" (Blanck, 1997). Understanding these responsibilities is necessary before proceeding with the strategic analysis.

Support to Beneficiaries

Bayne-Jones services a population of about 32,000 user beneficiaries (see Figure 5). This population includes approximately 11,625 assigned Active Duty (AD) members; 11,232 Active Duty Family Members (ADFM); 3,182 retirees; 5,064 family members of retired military; and 846 survivors (TDA, 1997). The Active Duty population artificially includes 3,700 soldiers not actually assigned to Fort Polk to account for cyclical training deployments since the installation serves as a large training base (J. Roberts, personal communication, August 1997.)

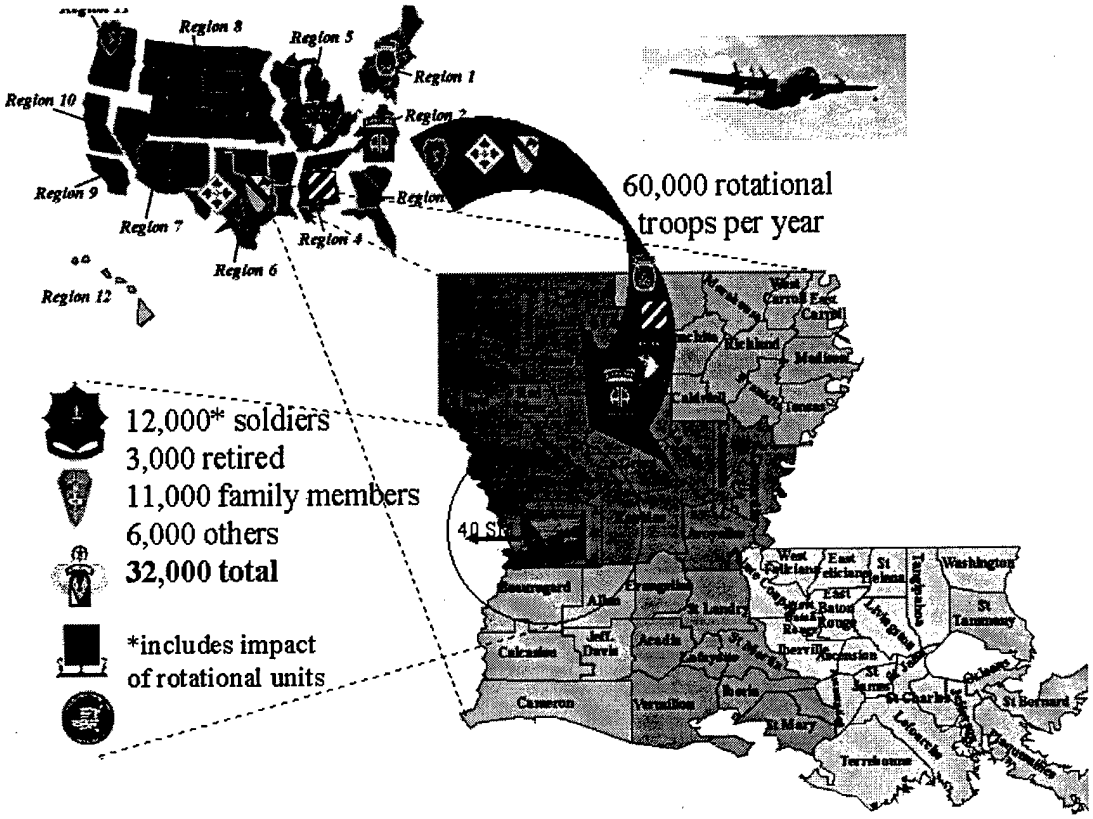


Figure 5. Depicted above is the number of beneficiaries which BJACH services (rounded to the nearest thousand). The red arrow depicts the rotational soldiers. The circle around the hospital represents the 40 statute mile catchment area. NOTE: The 60,000 external troops equate to approximately 3,700 beneficiary equivalents.

Interestingly, the TDA (1997) suggests BJACH provides significant beneficiary support, generating 28.4 beds occupied per day, 10.7 admissions per day, 1.8 live births per day, and 800 clinic visits per day; however this information is dated. In Fiscal Year 1997, there were actually only 16.5 beds occupied per day (J. Roberts, personal communication, August 1997). Figure 6 depicts the fall in bed days per 1,000 beneficiaries per year (the population has been stable since 1993). This analysis is important to understanding the potential futures of BJACH.

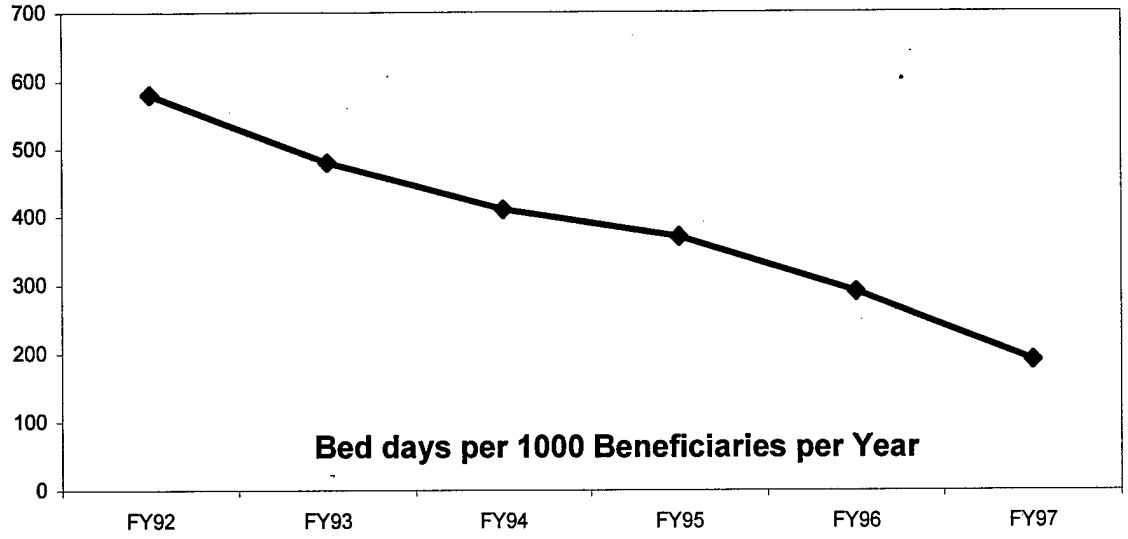


Figure 6. The chart above depicts the decline in bed days per 1000 beneficiaries per year. The Y-axis is the number of bed days per 1,000 beneficiaries while the X-axis is the Fiscal Year (FY). Appendix A is the full regression analysis.

Support of Readiness

The hospital not only has a beneficiary care mission, but it also has a significant readiness focus. The hospital supports the 115th Field Hospital and the 2d Armored Cavalry Regiment (ACR) through the Professional Officer Filler System (PROFIS). The PROFIS system assigns providers to positions in deployable unit's organizations (Army Medicine [On-Line], 1997). The PROFIS provider is a part of the medical facility but deploys with the PROFIS unit when necessary. The hospital also has a number of Forces Command (FORSCOM) nurses: nurses assigned to deployable units with duty at the hospital. The PROFIS and FORSCOM readiness missions affect the amount of beneficiary care and training support BJACH can provide.

Support of Training

The third essential function of Bayne-Jones Army Community Hospital is support of the training mission. The Hospital Commander is also the Joint Readiness Training

Center (JRTC) Surgeon. Because of this relationship, the hospital has duties and responsibilities for external training. To support the JRTC mission, the JRTC Surgeon provides medical observer-controllers for each training rotation, integrates real-world health support with simulated patient play, and plans and coordinates for improvements in medical training. In addition to JRTC, BJACH supports other training, both external and internal. This training includes Medical Proficiency Training (MPT), Physician Assistant (PA) training, Special Operations Forces (SOFOR) training, and the United States Army-Baylor Programs in Physical Therapy and Health Administration, etc (M. Y. Blackerby, personal communication, August 1997).

Chapter 2-The Situational Analysis

While Chapter I established the background information for BJACH, Chapter 2 adds to this foundation by discussing some of the internal and external forces driving the reengineering efforts of the organization. Each one of these forces requires separate evaluation.

Increased Operational Tempo

Bayne-Jones, like most other military medical facilities, deploys its soldiers more often than ever before. With the 2d Armored Cavalry Regiment deployment to Bosnia and the 115th Field Hospital deployment to Egypt this year, the hospital has seen a significant depletion in available provider staffing as depicted in Figure 7. Additionally, the number of lost officer man-days due to deployments and exercises has increased significantly over the last several quarters as depicted in Figure 8.

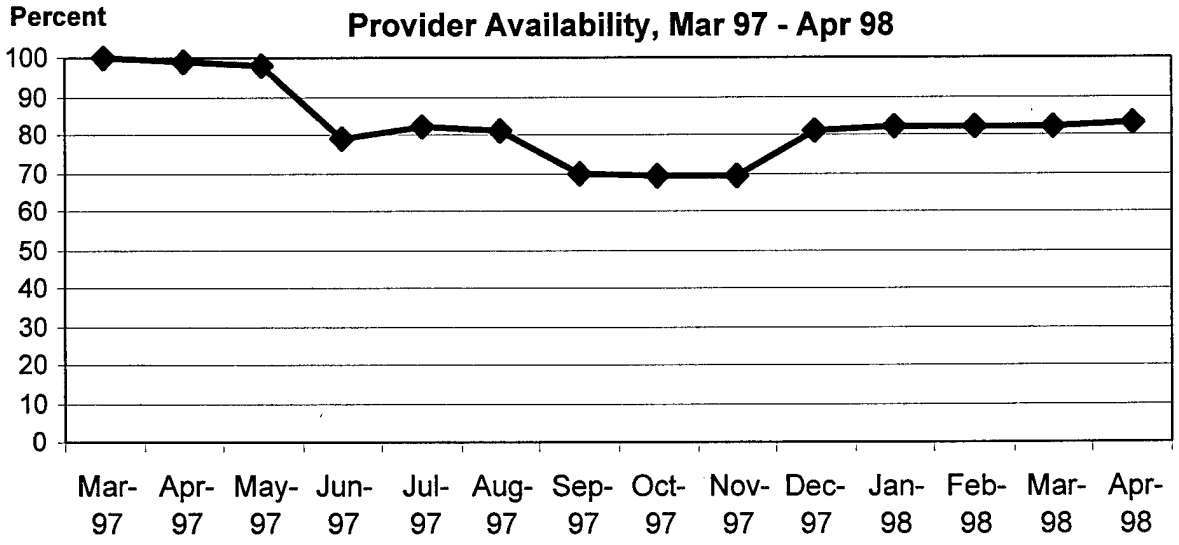


Figure 7. The unfitted graph above illustrates the significant shortage of Primary Care Managers (PCMs) experienced by BJACH. The 'Y'-axis indicates the percentage of authorized PCMs actually assigned. The 'X'-axis represents the months of the year. The picture is bleak with no apparent resolution through April (J.L. Fleming, personal communication, August 1997).

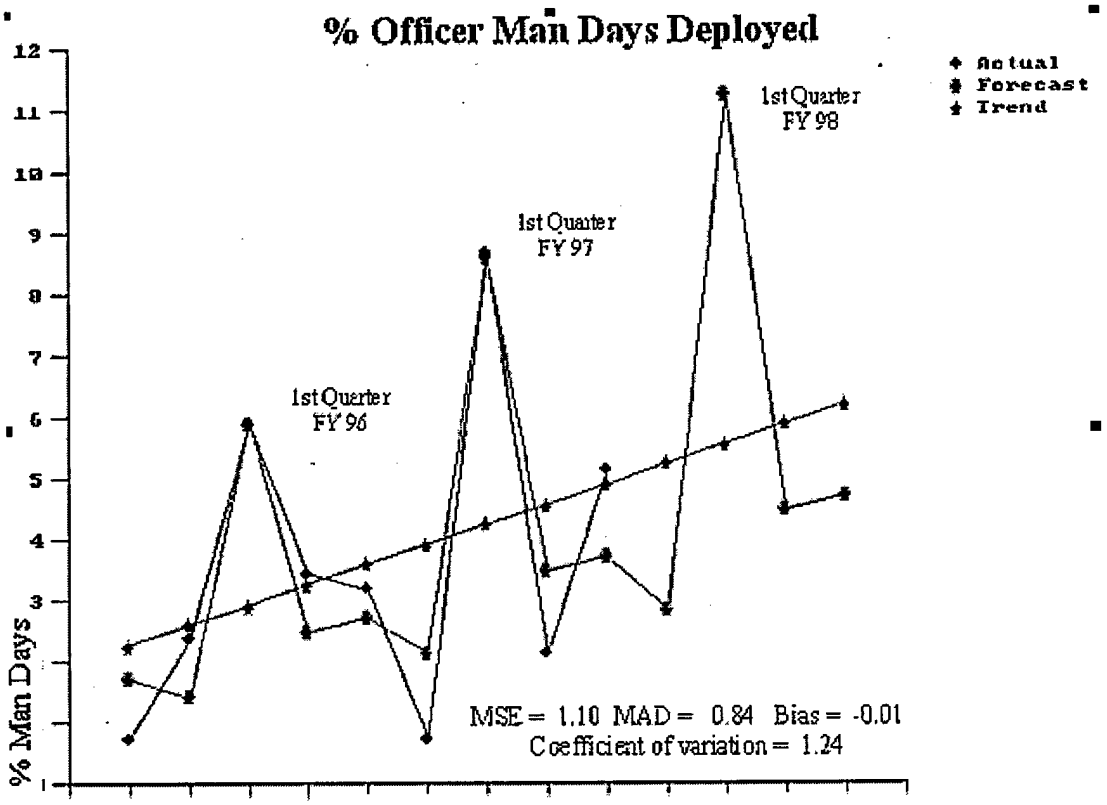


Figure 8. The decomposition chart above depicts the percent of officer man days lost strictly due to deployments and field training exercises from 3d Quarter (3Q) of Fiscal Year (FY) 1995 through 3Q FY97 with projections through 3Q FY98. The linear trend is positive, and the seasonality is obvious. The bottom line: sustainability of beneficiary care will be more difficult in the future. Appendix B explains decomposition and provides both decomposition and regression analysis. (Raw data from M.Y. Blackerby, personal communication, August 1997.)

The decrease in provider staffing and increase in deployments have had synergistic effects on beneficiary care and training support. These second and third order effects affect any strategic efforts of the hospital.

Decreased Staffing

As mentioned above, BJACH has deployed several of its military medical personnel. On top of the deployment shortages, the overall personnel strength in the

hospital (both civilian and military) has also declined in recent years. The personnel decline when compared to the population serviced, however, has an apparent third order relationship as depicted in Figure 9, so the hospital may just now be experiencing the true impact of the decrease in staffing. The loss of staffing affects the ability of BJACH to reengineer.

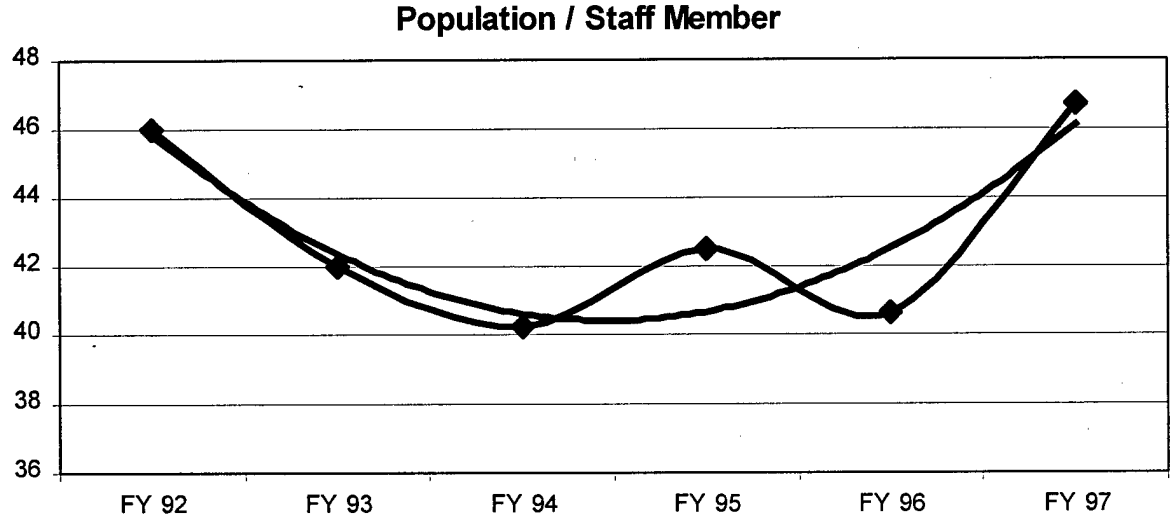


Figure 9. The chart above illustrates the beneficiary population per staff member assigned to the hospital. The 'Y'-axis depicts the number of eligible beneficiaries per staff member while the 'X'-axis depicts the Fiscal Year. Note that the beneficiary to staff ratio has increased beyond FY 92 levels largely due to a decline in personnel assigned (J. Roberts, personal communication, August 1997). The results of cubic regression indicate that, although 75% of the variance of Y is accounted for by X, the null hypothesis can not be rejected (See Appendix C for complete cubic regression).

Decreased Budget

Just like every other military facility, BJACH is undergoing a period of shrinking budget. Over the last several years, the Operations and Maintenance (O&M) and Military Pay and Allowance (MPA) budget has significantly declined as depicted in Figure 10. To cope with shrinking budgets, BJACH eliminated Continuing Medical

Education (CME) travel funding and civilian cash awards in 1997 (J. Butler, personal communication, August 1997). The 1998 budget (not depicted) is roughly equal to the 1997 budget; however, adjusting for inflation results in a continued downward trend in real purchasing power, assuming no mid-year or end-of-year adjustments. Recent information from Great Plains Regional Medical Command suggests a potential six-percent decrement is likely for 1999 (C.W. Fox, personal communication, May 1998). Without additional funding, reengineering opportunities are restricted.

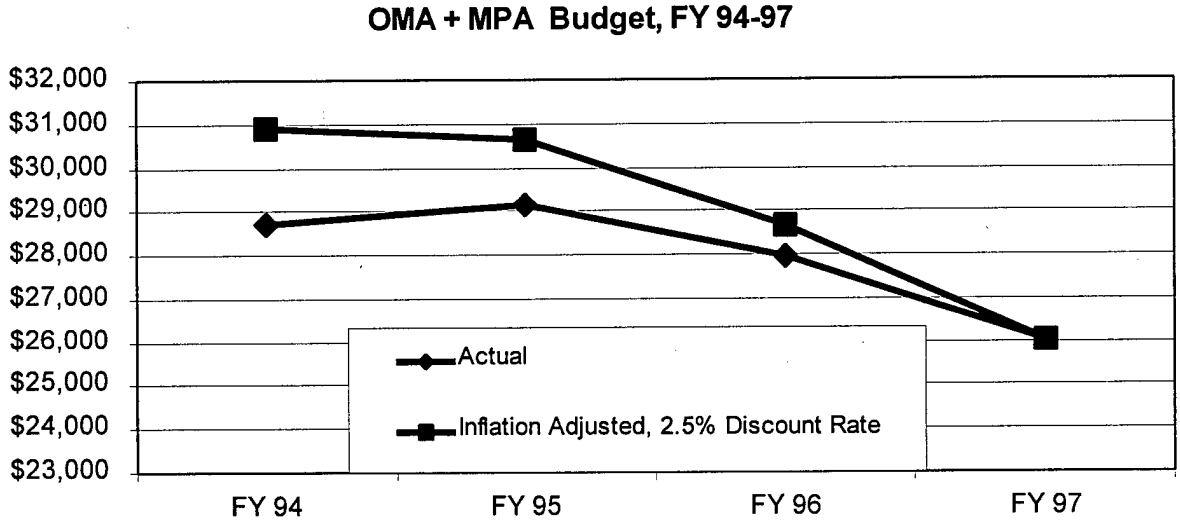


Figure 10. The graph depicts both the actual and inflation adjusted budget for BJACH from Fiscal Year (FY) 1994 through 1997 (Raw data from J. Roberts; Chief, Resource Management; personal communication; August 1997).

Decrease in Workload

With the loss of many of BJACH providers to deployments, workload has dropped. The workload may have shifted to the TRICARE military network or other civilian agencies. The workload shift is visible in the rate of outpatient clinic visits per total beneficiary population (Figure 11). Strategically, loss of staff results in loss of

workload, a possible TRICARE Bid Price Adjustment (contractual penalty), and a possible loss of personnel due to the workload-based Automated Staffing and Assessment Model (ASAM). The ASAM model establishes personnel requirements, which, if established below current authorizations, eliminates those authorizations (J. Roberts, personal communication, October 1997). This cycle can be broken through increasing provider productivity. Loss of workload is a primary consideration for BJACH's strategic planning.

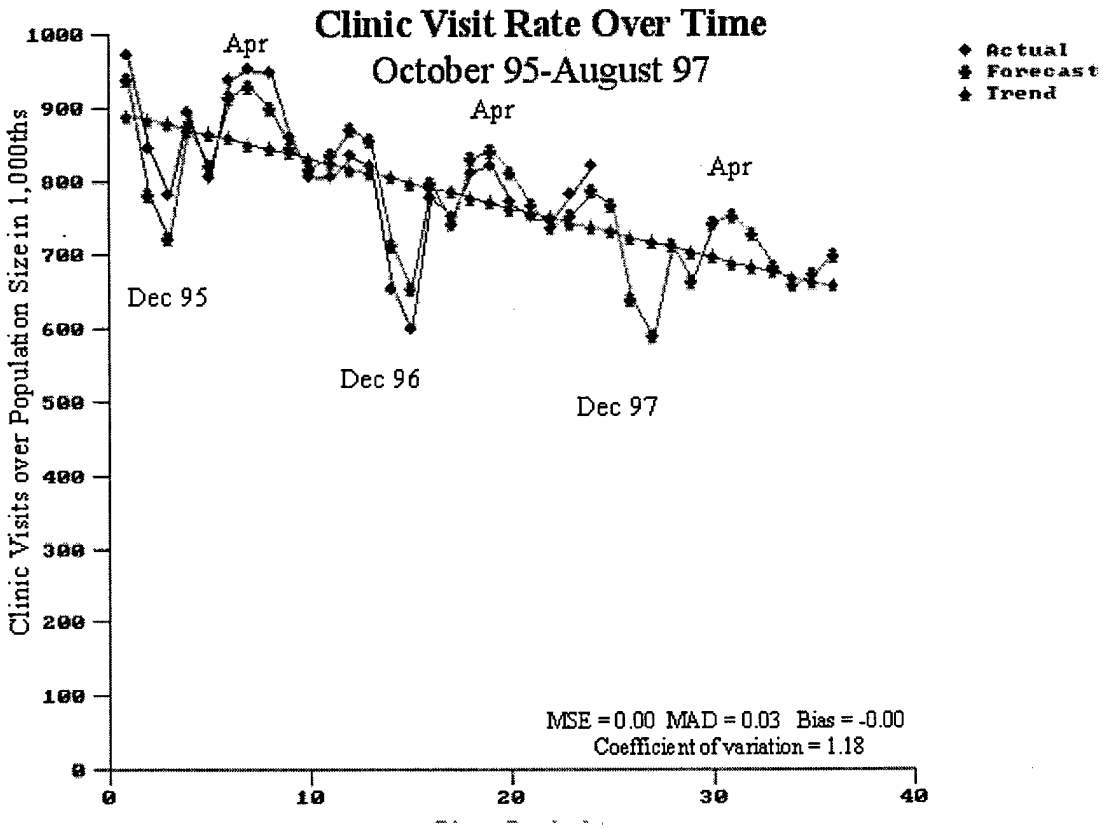


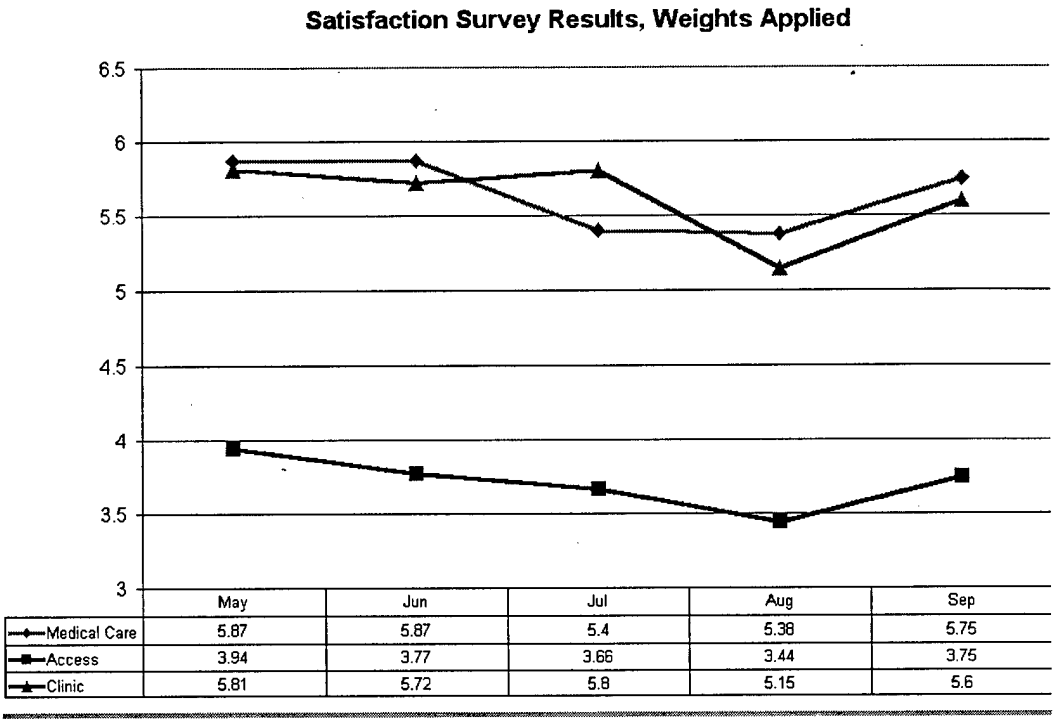
Figure 11. The decomposition graph depicts the rate of outpatient clinic visits per beneficiary from October 1995 through September 1997. The X-axis reflects the current month while the Y-axis is clinic-visit rate per thousand beneficiaries (Data from the Military Expense and Personnel Reporting System (MEPRS)). (See Appendix D for complete regression and decomposition analysis.)

Ineffective Training Support

As mentioned previously, Bayne-Jones Army Community Hospital supports the Joint Readiness Training Center (JRTC), and the Hospital Commander is both the Director of Health Services for Fort Polk and the JRTC Surgeon. As the JRTC Surgeon, he is the senior medical observer-controller and is responsible for ensuring that real-world casualty collection, evacuation, and treatment is conducted seamlessly while simulated medical processes are conducted intelligently. Two problems are apparent. First, the JRTC Surgeon has no organizational support structure to integrate simulated patient play and real-world patient collection, treatment, and evacuation. Second, the evacuation process itself is currently not seamless (C.W. Fox, personal communication, August 1997). Appendix E is an After Action Report from a previous JRTC rotation, written by both the participating unit and BJACH documenting these problems.

Decreased Satisfaction

Over the last several months, Bayne-Jones Army Community Hospital has seen a decline in patient satisfaction with quality, access, and clinics based on reports from the Department of Defense patient satisfaction survey. Although the survey process itself is partially flawed (see Appendix F), Figure 12 provides evidence of a potential problem. More data points are necessary to draw any conclusions, however, and the cyclical component associated with seasonal changes in demand due to flu season, school physicals, etc. requires analysis after collection of one year of data. Regardless of accuracy or completeness, GPRMC is currently using this survey to compare hospitals to each other. Satisfaction of patients is another area of focus for the strategic analysis.



	May	Jun	Jul	Aug	Sep
Medical Care	5.87	5.87	5.4	5.38	5.75
Access	3.94	3.77	3.66	3.44	3.75
Clinic	5.81	5.72	5.8	5.15	5.6

Figure 12. This graph depicts three specific metrics of the Department of Defense Customer Satisfaction Survey for May-September 1997: satisfaction with medical care, access, and clinics. The Y-axis reflects a 7-point Likert scale for satisfaction with medical care and clinics; however, satisfaction with access is based on a 5-point Likert scale. NOTE: the contractor initially failed to provide data for July 1997 and skewed the satisfaction results by evaluating trends on a rolling quarter.

Inability to Capture JRTC Data and Communicate with Rotational Units

Despite the fact that the JRTC training at Fort Polk began in the 1980's, epidemiological analysis of visits is not available. This fact is the antithesis of health promotion and disease prevention. Coupled with this problem is the failure of the Fort Polk medical community to communicate effectively with rotational units. This failure results in confusion about the Fort Polk medical system interface with JRTC and is a strategically significant issue for BJACH.

Strengths, Weaknesses, Opportunities, and Threats

The organization's current strategic plan identifies (in broad terms) Strengths, Weaknesses, Opportunities, and Threats (SWOT). The SWOT analysis (Appendix G) does not list, however, a significant threat to the survival of BJACH as a hospital. Kongstvedt (1996) suggests an essential aspect of market assessment is understanding the competition, something the current SWOT analysis does not consider. Since the hospital is small and many of the services the hospital offers are available in the local community, BJACH's continued survival as a full inpatient hospital may be threatened. Right now, however, the organization is still the sole-source local provider of obstetric and gynecological (OB/GYN) care, which ensures its short-term survival. Byrd Hospital in Leesville (immediately outside of Fort Polk) has ventured into the OB/GYN market before (August 1997) and is attempting to do it again (personal communication, Lorraine Smith, Administrative Assistant at Byrd Regional, November 11, 1997). If Byrd Hospital achieves success in providing this care, it poses a real threat to the existence of Bayne-Jones as a community hospital as the requirement for maintaining inpatient care further diminishes. The need for strengthening the marketing relationship between BJACH, JRTC, and readiness becomes apparent.

Chapter 3-Analysis of the Strategic Plan, the Mission, Vision, Values, and Key Performance Areas

Completion of the situational analysis leads to evaluation of the strategic mission, vision, values, and key performance areas. This analysis is necessary for the development of organizational strategies. Although some strategies may require culture change, all of them must be congruent with the organization's values.

Evaluation of the Mission

The approved mission statement for BJACH is vastly different from the specified by the Table of Distribution and Allowances. According to the TDA (1997), the BJACH mission is:

> MEDDAC (the Medical Activity, Fort Polk) provides health services to authorized personnel within the Fort Polk Health Services Area. Services include inpatient and outpatient medical treatment to active and retired military personnel, their family members, and other personnel as authorized by Department of the Army and Preventive Medicine Services.

Duncan, Ginter, and Swayne (1997) suggest that mission statements must effectively capture the organizational purpose. This mission statement does not encompass all of the essential responsibilities of the unit's purpose including support of JRTC and support of readiness.

As indicated earlier, the hospital provides support to JRTC. This support is critical to the existence of the facility and yet not reflected in the TDA mission statement. Incorporating this component of BJACH operations is critical. In addition, the PROFIS and FORSCOM missions are noticeably absent. These important functions must appear in the BJACH mission statement.

Army Field Manuals 25-100 (Training the Force, 1988) and 25-101 (Battle-Focused Training, 1988) indicate missions should must link with the next higher commander's mission, external directives, and the commander's guidance as depicted in Figure 13. This process served as the basis for development of the approved mission statement.

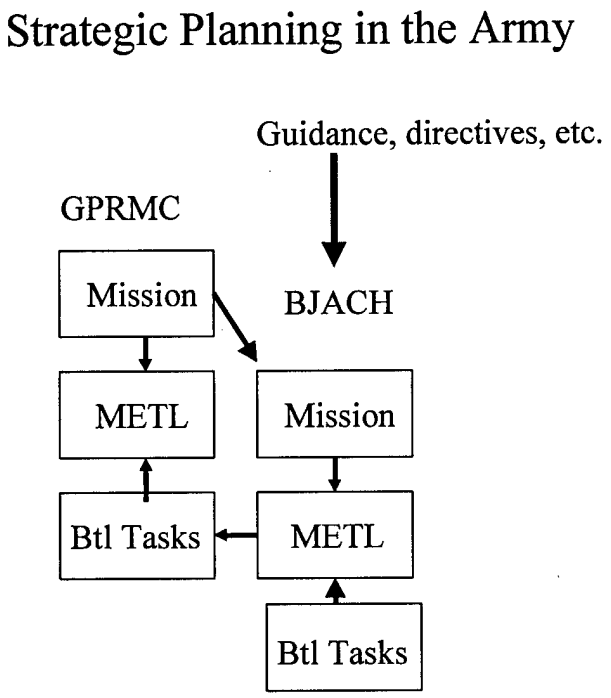


Figure 13. The process for determining the Mission Essential Tasks shown above is the military method for strategic planning in unit's with identified missions. NOTE: Battle Tasks ("Btl Tasks") equate to objectives and METL tasks equate to key performance areas (Army Field Manual 25-100 and 25-101).

Using the METL development process, the hospital conducted a basic mission analysis by evaluating the missions of the United States Army Medical Command (MEDCOM), Great Plains Regional Medical Command (GPRMC), and the Joint Readiness Training Center (JRTC). These mission statements are included in Appendix H. The result of this crosswalk is the mission statement depicted in Figure 14. This

mission statement captures the essence of Bayne-Jones Army Community Hospital. Any strategies developed must consider all of the components of this mission.

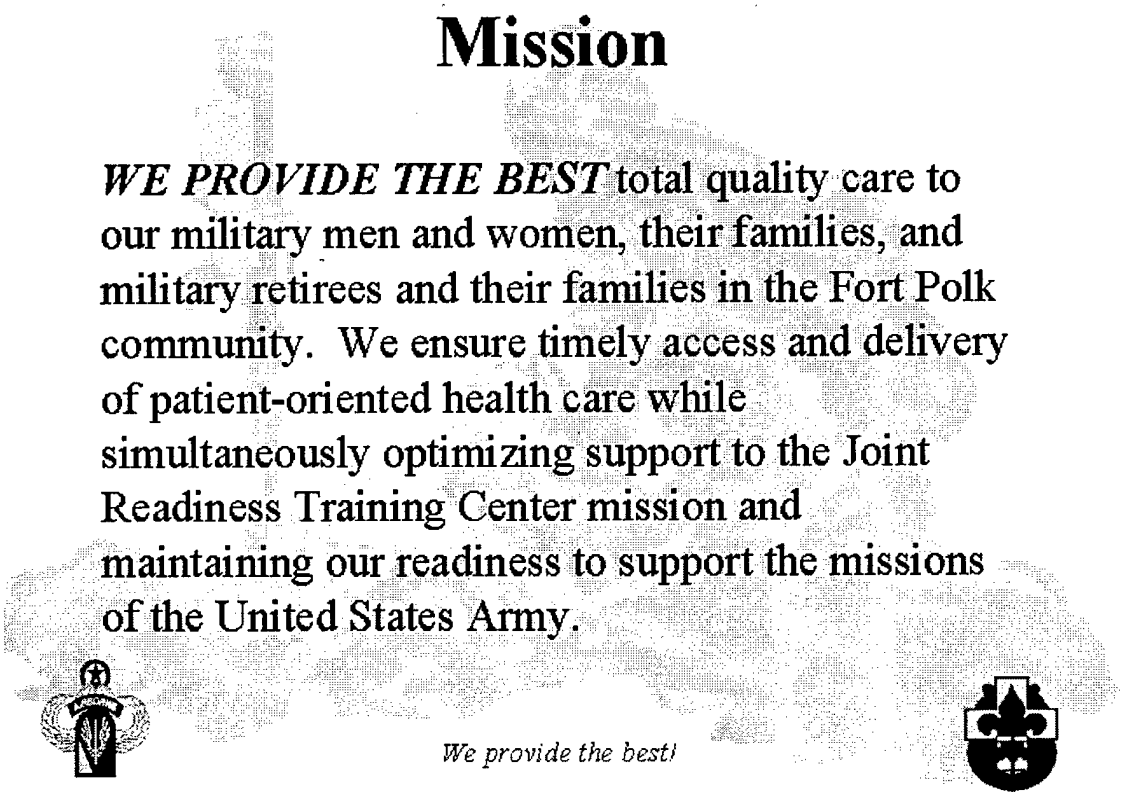


Figure 14. This slide depicts the approved mission statement of BJACH.

Evaluation of the Vision

Mission statements reflect what the organization does, while vision statements describe where the organization is going. In strategic planning and analysis, the vision statement is the beacon and control in times of crisis (Peters, 1988). Figure 15 is BJACH's approved vision statement.

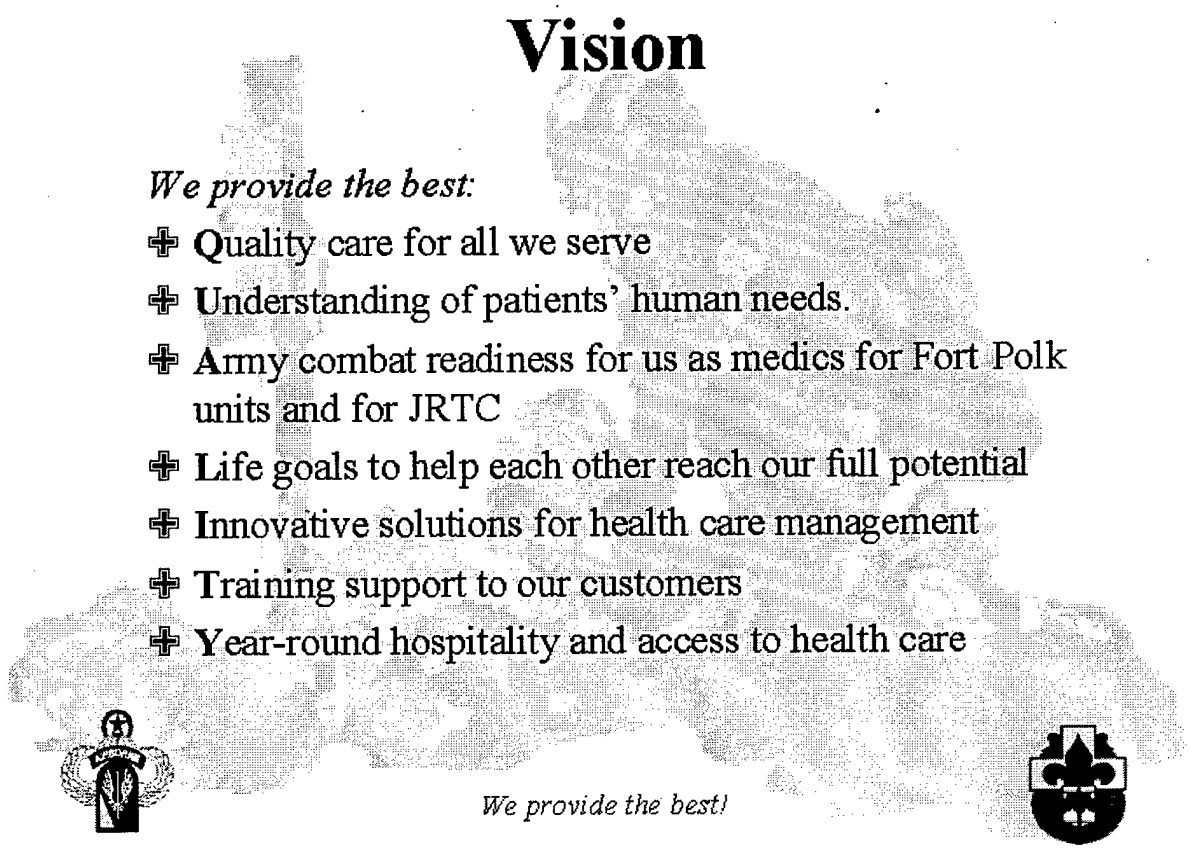


Figure 15. This slide illustrates the vision for the hospital. Note that the first letter of the bullet comments spell "QUALITY" (Bayne-Jones Army Community Hospital Wellness and Readiness Web Site [On-Line]).

Tom Peters (1988) suggests that effective visions have common characteristics. They should inspire, should be clear, and should be challenging. They should be about excellence; make sense in the relevant community; and be flexible. They should also stand the test of time; be stable but challenged and changed as necessary; be beacons and controls in times of crisis; empower; prepare for the future while honoring the past; and come alive in details not generalities. These criteria serve as the basis for evaluation of BJACH's vision.

The vision statement for BJACH appears to meet many of Peters' qualifications for effective visions. The focus on excellence is clear as the vision suggests a move towards the "best" in seven different areas while focusing on overall quality. The first four words are the organization's beacon: "We Provide the Best." These words also serve as the hospital motto, which instantly indoctrinates new members of the organization. Although stated in the present tense, the vision appears to be future-focused since "the best" is a continuously moving objective. Any strategies developed in will need to ensure a move towards quality and the seven areas specified.

Evaluation of Values

While evaluation of the mission and vision provide direction for the strategy development, evaluation of the values provides the parameters (evaluation and screening criteria) for acceptable strategies. Implementation of strategies incongruent with organizational values is ill advised; therefore, evaluation of values is critical to the success of any strategic planning process. Inculcated organizational values combined with individual values generate much of the corporate culture, which is the critical link between strategy and results (Vestal, Fralicx, & Spreier, 1997.)

The stated values of Bayne-Jones Army Community Hospital are: dedication to high-quality patient care, selfless service, personal and professional integrity, compassion, and "patient." Values are, by definition, "principles that, along with the mission, make an organization unique" (Duncan et al., 1995, p. 195). Dedication to quality care, selfless services, integrity, and compassion are all admirable stated values; however, the "patient" does not fit the definition. Although the focus of the organization may be the patients, clearly "patient" is not a principle. In development of strategic plans, balancing

the external and internal forces of change with these values is critical to organizational success.

Evaluation of Key Performance Areas

Key performance areas emerge from the mission and vision analysis and are within the parameters set by the organizational values. Rockart (1982) suggests only those areas of activity critical to success should represent the key performance areas. Figure 16 represents the five key performance areas currently identified in the BJACH Strategic Plan. Essentially, these performance areas are the Mission Essential Task Lists (METL) referred to in Training the Force (1988) and Battle-Focused Training (1988). The key performance areas should therefore match or at least closely parallel the METL. The approved METL tasks of BJACH are in Figure 17.

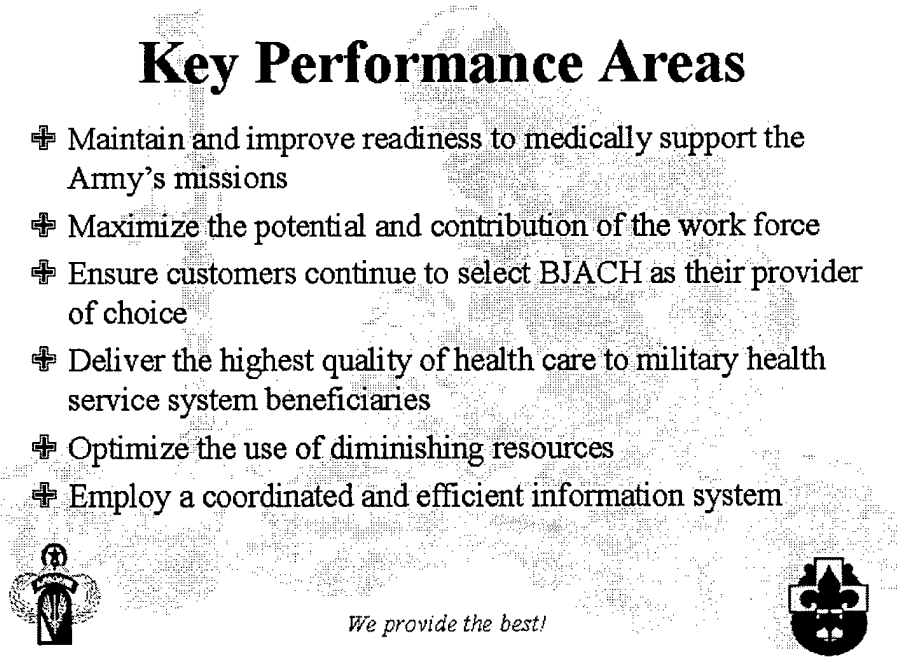


Figure 16. The slide above depicts the key performance areas for BJACH.

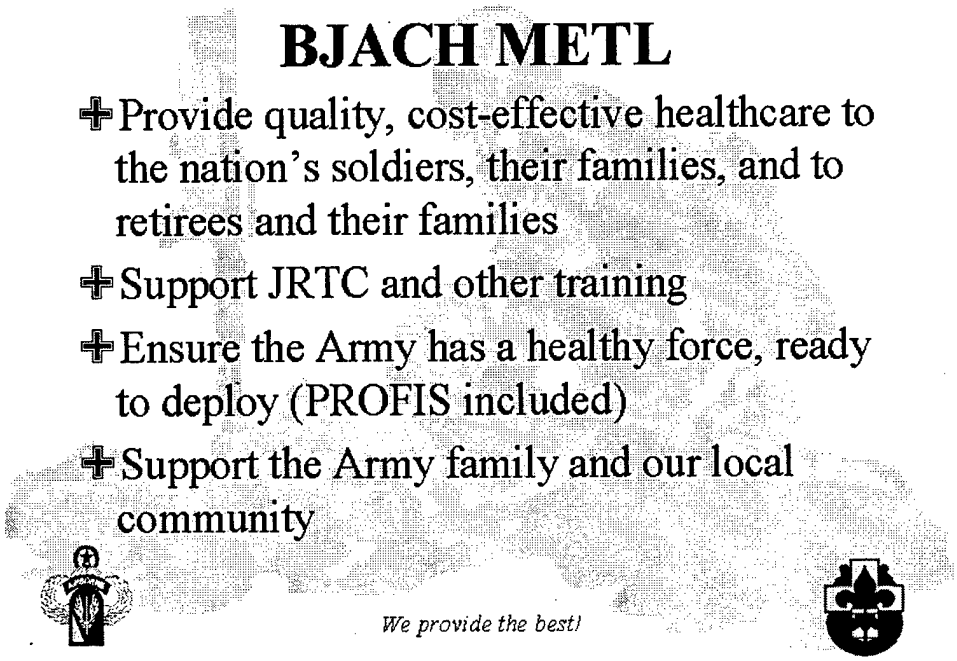


Figure 17. The METL for BJACH loosely matches the organization's key performance areas.

Although the two sets of objectives do not match, there is some commonality. Both focus on readiness and beneficiary care; however, the best resolution to the sets is through union, not intersection. Strategic options must focus on achieving success in these performance areas in order to be viable.

Chapter 4-Recommended Strategies

While Chapter 2 and Chapter 3 provided the background information for strategic plan development, Chapter 4 provides the actual strategies. Through continuous scanning of the environment, these plans changed significantly over one year.

Strategic Formulation and Directional Strategies

To proceed with strategic formulation, an organization must have consensus on its mission, vision, values, and broad objectives (Duncan et al., 1995). Bayne Jones Army Community Hospital has achieved this consensus. The directional strategies deriving from the mission, vision, values, and key performance areas are three-fold: move towards leadership in total quality care for beneficiaries (to include leadership in health promotion), optimize support for JRTC and other training, and optimize support of readiness.

Adaptive Strategies

While directional strategies provide strategic guidance, adaptive strategies focus on operational employment to achieve strategic success. The adaptive strategies initially approved by the hospital primarily focused on expansion and stabilization. These strategies included: forward vertical integration (the establishment of miniature Health Maintenance Organizations in the Troop Medical Clinic and hospital linked to the supported units), health promotion innovations, access to care innovations, product development (the introduction of the Internet web server "products"), penetration through alliance (reorganization to link the hospital more closely with JRTC), and related diversification (acquisition of the 36th Medical Detachment-Air Ambulance). However, through situational awareness, contraction strategies of liquidation and retrenchment

replaced forward vertical integration: the HMOs will operate out of the hospital and the TMC will provide integrated mental health services.

Forward Vertical Integration?

The first adaptive strategy considered and approved by BJACH focused on health promotion and prevention. Through combining preventive medicine and primary care assets, the organization hopes to attain a leadership role in health promotion in accordance with the BJACH vision.

The execution of this adaptive strategy initially involved the decentralization of organizational assets at the Troop Medical Clinic. The goal was the establishment of two Health Maintenance Organizations, one at the TMC and one at the hospital, focused on health promotion, and aligned functionally with units and their dependents. This forward vertical integration (expansion towards the customer) would be economically disastrous if implemented, however. Through simple financial and utility matrix analysis, the organization decided to establish the HMOs within the hospital facility. The following sections provide in depth information about the HMO initiative.

Wellness and Readiness Center Techno-Structural Intervention

To become the leader in prevention and promotion, the organization adopted the Wellness and Readiness (WAR) Center concept. The WAR Center concept combines the Department of Preventive Medicine Service and the Department of Family Practice underneath the Deputy Commander for Clinical Services. The complete implementation date of the concept is 15 August 1998; however, elements become operational in phases beginning 1 June 1998. Figure 18 depicts the approved Wellness and Readiness Center organizational mission and vision.

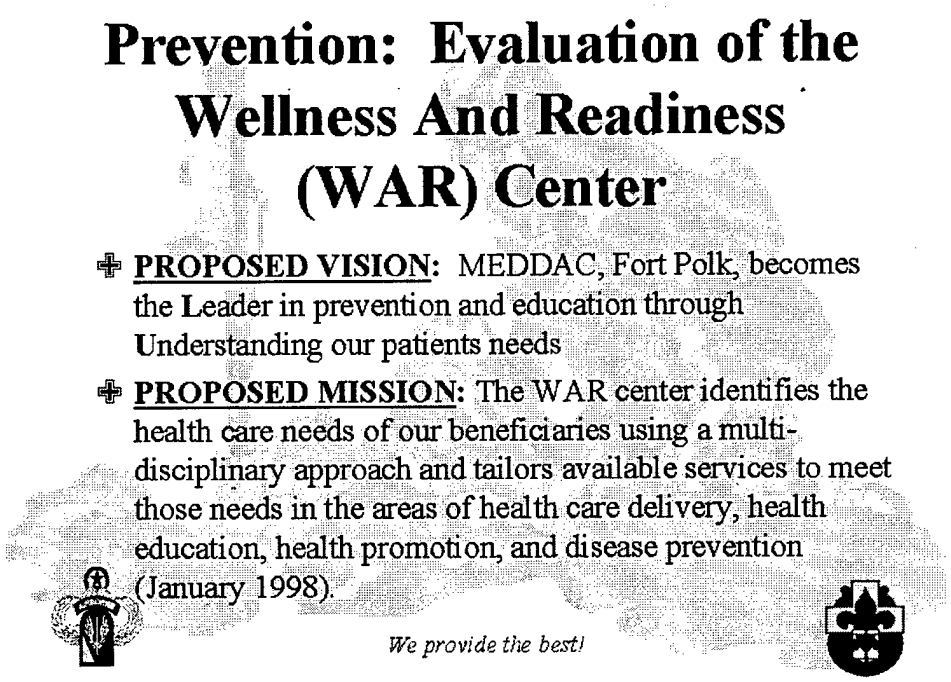


Figure 18. The slide above depicts the vision and mission of the WAR Center. NOTE: the red letters visually depict tie-in to the unit's vision.

Wellness and Readiness Company Techno-structural Intervention

As part of the WAR Center, Wellness and Readiness (WAR) Company structures will serve as the primary care interface. These WAR Companies will be task-organized under the WAR Center and will integrate the hospital medical assets with the deployable unit medical assets of empaneled organizations to achieve synergy of mission and improved readiness. The organization will empanel beneficiaries based upon sponsor unit of assignment with TRICARE Prime retirees and their families empaneled based upon remaining capacity. The first WAR Company team activates on 1 June, with the remaining teams phased in through July. Figure 19 provides an overview of their mission and vision. Figure 20 illustrates proposed innovations associated with the companies.

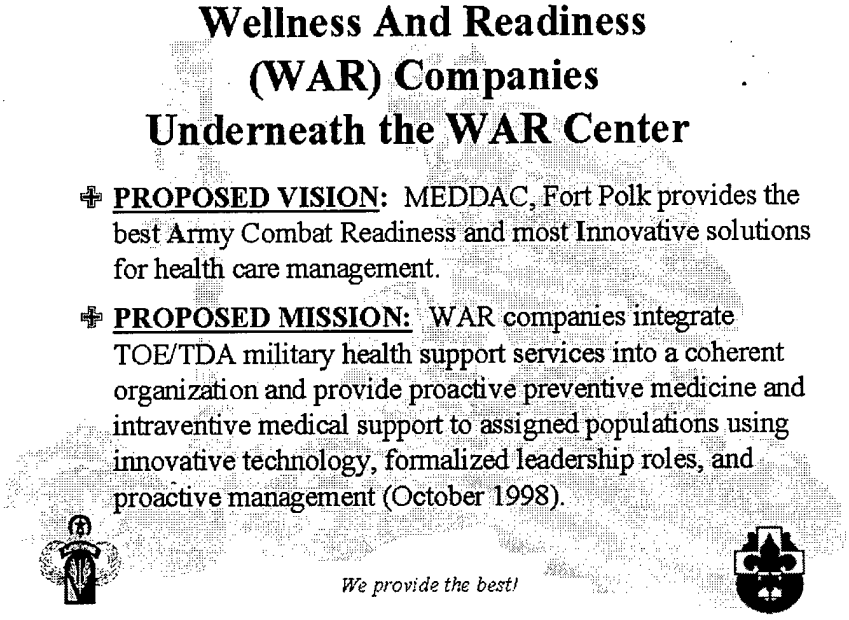


Figure 19. Depicted above are the WAR Company proposed vision, mission, and specific innovations and objectives. NOTE: the red letters visually depict tie-in to the unit's vision.

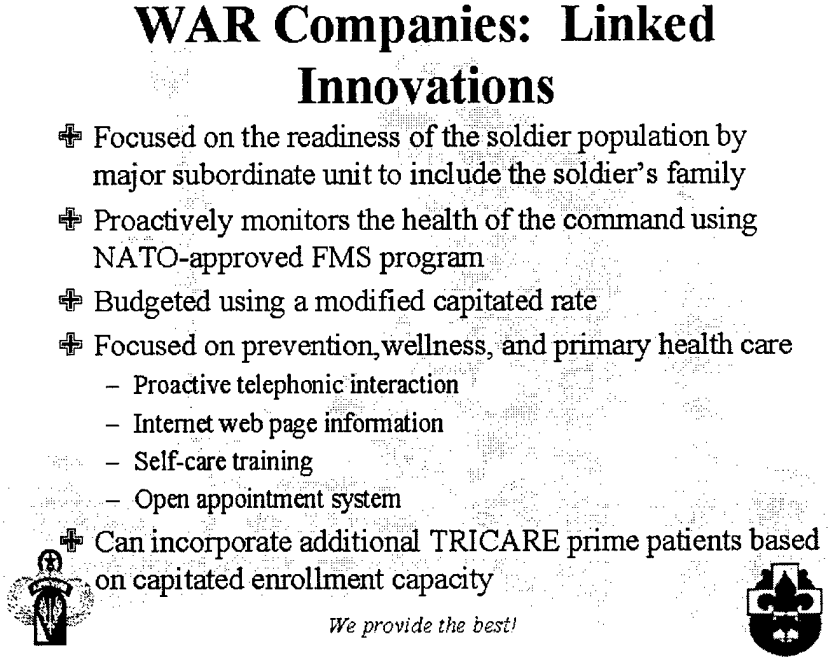


Figure 20. These innovations are part of the wellness efforts of the WAR Companies. NOTE: many of these interventions are the focus of the strategic products provided in later chapters.

Figure 21 is the approved organizational structure for the WAR Companies and WAR Center. Stochastic modeling determined the organization of each company and provides the content of a later chapter.

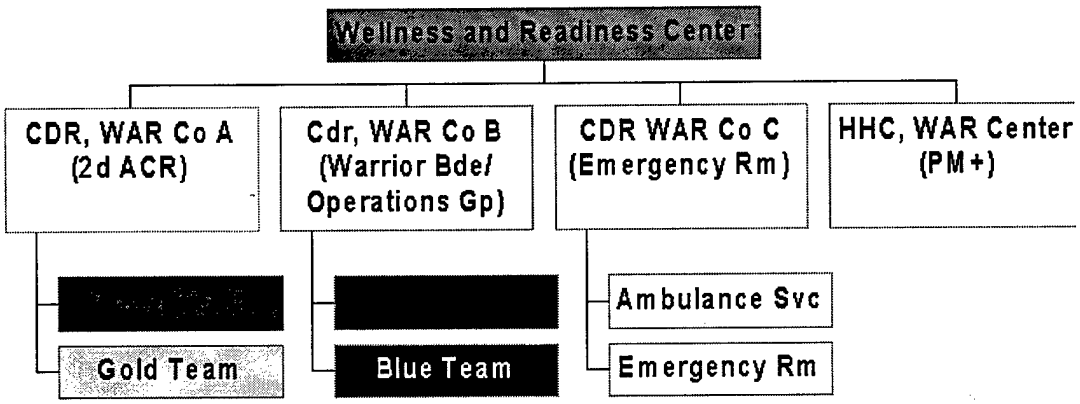


Figure 21. The approved organization of the WAR Center establishes four commands (NOTE: only one of these commands, the Headquarters and Headquarters Company or HHC, is competitive for non-physicians.)

Retrenchment and Liquidation

Evaluation of the cost and efficacy of establishing WAR Company B in the TMC resulted in an entirely different solution. The TMC providers will establish their HMO in the hospital itself. Ancillary equipment (X-rays, laboratory equipment, etc.) will be liquidated. Mental health assets (psychiatry, social work service, etc.) will move to the TMC and integrate their operations. Appendix I depicts the reasons for this major shift; however, quality, cost, and access to services are the primary forces. The retrenchment and liquidation has met with employee and union approval and begins 19 June 1998. Appendix J is the basic plan for integration and overall operation of the Wellness and Readiness Center. (NOTE: the true savings of the integration will not be known until all

creditable turn-ins and sales are completed; however, personnel savings alone are estimated at $240,000 per annum.)

Enhancement of Services-Health Promotion Innovations

Innovations in health promotion, improved access to care, and innovations in use of technology are critical components in the directional strategies for BJACH as evidenced by both its vision and mission. Accomplishing these objectives requires specific programs and processes.

The innovations depicted in Figure 20 represent some of the proposed and approved concepts designed to make BJACH the leader in cost-effective prevention and health promotion. As part of the evolution of the organization, each of the WAR Companies will phase-in implementation of a comprehensive prevention and care management plan and will be budgeted based on a set capitated rate. Specific initiatives follow.

Augmentation Telephone Center

Health promotion and wellness requires proactive interaction of medical staff and patients. Registered Nurses (RNs) and Licensed Practical Nurses (LPNs) assigned to WAR Companies will provide this interaction through an active phone campaign, answering their customers' questions and calling them proactively for health promotion measures such as scheduling for physicals and mammograms. Although the Health Care Information Line (HCIL) sponsored by the TRICARE network assists patients, the system is reactive not proactive. Patients must telephone TRICARE network to access this benefit. This type of initiative appears to be successful in reducing demand (Lazarus & Silverstein, 1996).

In order to track the requirements and satisfaction of their patients, a comprehensive database is required. Although the Department of Defense survey of patient satisfaction provides generic information, the instrument can not assess failures in systems and processes specific to the Medical Treatment Facility (MTF). One of the products of this GMP ("The Patient Advocate" software) provides a solution to this problem.

Budgeting WAR Companies through Capitation

The situational analysis revealed the continued decline in the purchasing power of BJACH. This fact coupled with the likely implementation of enrollment-based capitation force BJACH to consider alternative methods of funding primary care.

Linked to the prevention and readiness initiatives are the financial initiatives designed to ensure cost-effective, quality health care. These interventions will also establish BJACH as the leader in innovative solutions for health care management.

Each of the independent WAR Companies will receive an amount of money for the population serviced. This money will cover full costs, fixed and variable (Finkler, 1994). The budget (B) for each clinic will be based upon the total population (N) which is both enrolled in TRICARE Prime and assigned to the clinic multiplied by a set capitated rate (CR); $B = N * CR$. Resource Management at BJACH will be responsible for continually monitoring and adjusting the capitated rate as necessary.

Capitation normally serves to align providers' or practice groups' interests with a managed care organization (Gapenski, 1996); however, military physicians receive as fixed salary regardless of population supported or practice profile. To compensate for this problem, teams saving the organization money will be allowed to spend a portion of

this money at their discretion. Commanders and team leaders incapable of meeting budget may eventually be subject to removal.

Command Health Report

One of the most significant problems in determining the success of health promotion and readiness status of deployable soldiers is the inability of BJACH to measure the status of required prophylactics as described previously in the situational analysis. Metrics are a critical component of health promotion and readiness. Currently, BJACH tracks, trends, and analyzes very few metrics for readiness or wellness purposes.

As part of the solution to this problem, BJACH will leverage the relationship between the individual command and the hospital to gather and track command health information. Commanders at all levels will then have visibility over their soldiers' readiness and health status. The means of attaining this end is through a comprehensive networked computer program. Existing systems (including the Medical Occupational Database System (MODS) and the Mobilization Level Augmentation System (MOBLAS) are not yet fully functional and are not intended for managing health requirements of all beneficiaries (B. Rather, Plans and Operations, April 1, 1998). At the local level, interim programs are required in order to accomplish this mission. Two of the products of this GMP address this data gathering, tracking, and trending issue.

Enhancement of Services-Access to Care and Education Innovations

Just as important as the health promotion innovations are the BJACH strategies for improving access to care and patient education (a form of demand management). Without education, visit rates will likely remain relatively constant and access will probably not improve significantly. The popular Health Belief Model (Williams and

Torrens, 1993) suggests education might be able to address perceived need (cues to action) and possibly reduce demand for services. Consequently, access to care for truly sick individuals will increase. Both are required elements of health promotion and wellness.

One of the education initiatives BJACH has adopted is the hosting of a health and wellness web site. Activated in October 1997, the health and wellness web site provides information on a variety of health, wellness, and disease-related topics. Marketing this site through the installation paper and television continue. One of the later chapters provides more in-depth information about this management product; however, Internet customer service initiatives in the medical service arena have been successful and are necessary for quality and cost improvements (Goldstein, D., 1998).

Product Development-Self-care Training and Internet Scheduling

Another demand management tool BJACH will institute is self-care training. Self-care training focuses on teaching patients how to take care of their illnesses appropriately. Encouraging people to attend classes, however, is challenging. To improve attendance and increase the overall wellness of the population while simultaneously reducing demand, BJACH will authorize individuals who have received the training to access an Internet site and schedule their clinic appointments from home. The self-care training will also allow these patients to receive over-the-counter medications without a doctor's prescription. Information about the Internet scheduling system appears in a later chapter.

Penetration through Alliance- the JRTC Techno-Structural Interventions

Improving health promotion, improving access to care, and developing unique products serve to differentiate BJACH from its competitors; however, differentiation does not necessarily equate to continued survival. One of the techniques BJACH is now employing involves reorganization of internal assets to support the association of the hospital with the Joint Readiness Training Center and the implementation of an alliance. These actions will address the issue of inadequate support for JRTC training.

One of the issues described in the situational analysis was the fragmentation of training support. Unfortunately, BJACH's original organization chart separated training assets into clinical and non-clinical categories. This artificial separation resulted in confusion over responsibilities, loss of economies of scope, and inability to support JRTC adequately. Economies of scope refers to potential savings resulting from producing different product lines jointly (Feldstein, 1991).

The techno-structural reorganization completed to address this issue was the integration of Plans, Training, Mobilization, and Security with Clinical Education Division to form a new organization: Operations and Training Division. Although not a new concept for military facilities (C. Eiteljorge, Chief of the Department of Nursing, personal communication, August 1997), the concept was novel in that the Plans and Operations Branch would function with JRTC and provide observer-controllers on occasion. The intent was clear: integrate BJACH's training assets and effectively link the organization to the training mission of JRTC. Figure 23 depicts the organizational diagram.

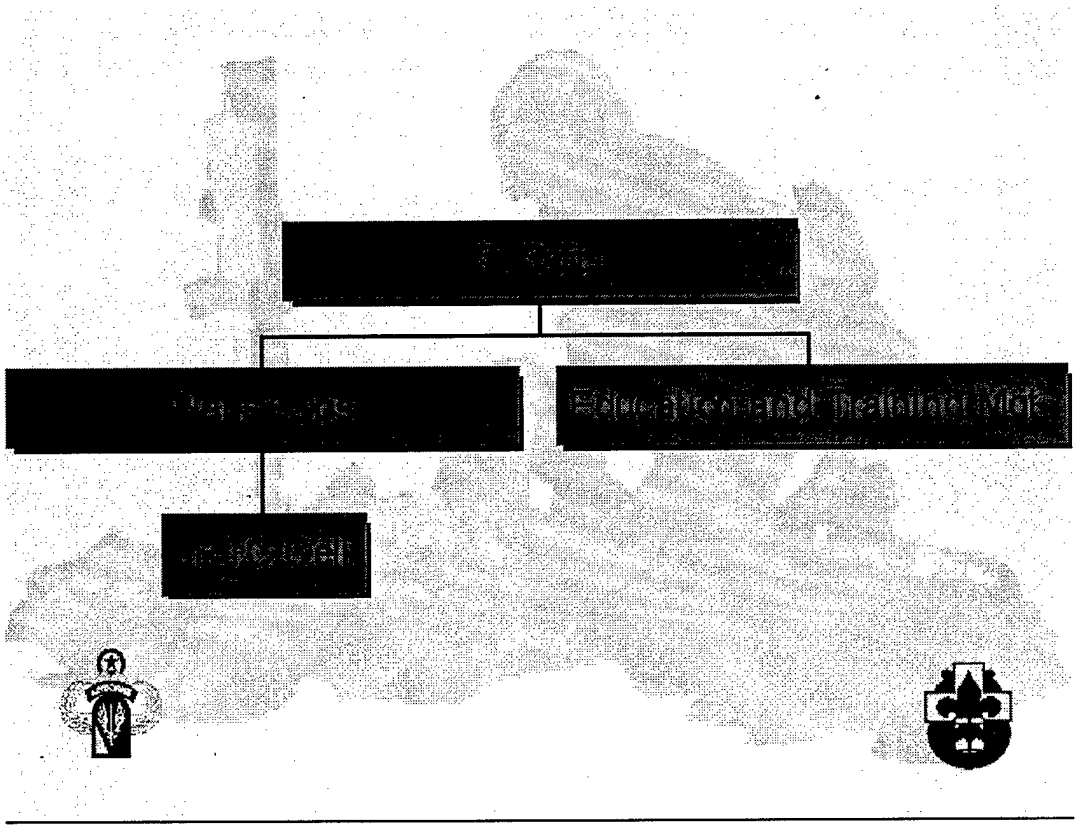


Figure 22. Represented is Operations and Training Division. The author began this staff action in August 1997.

The alliance concept critically links the planning element of Operations and Training Division with the Observer/Controllers of JRTC to ensure seamless Combat Health Support. By establishing this alliance, BJACH becomes a vital player in JRTC training operations and further differentiates itself from other competitor facilities. Figure 23 is the organizational diagram for this relationship.

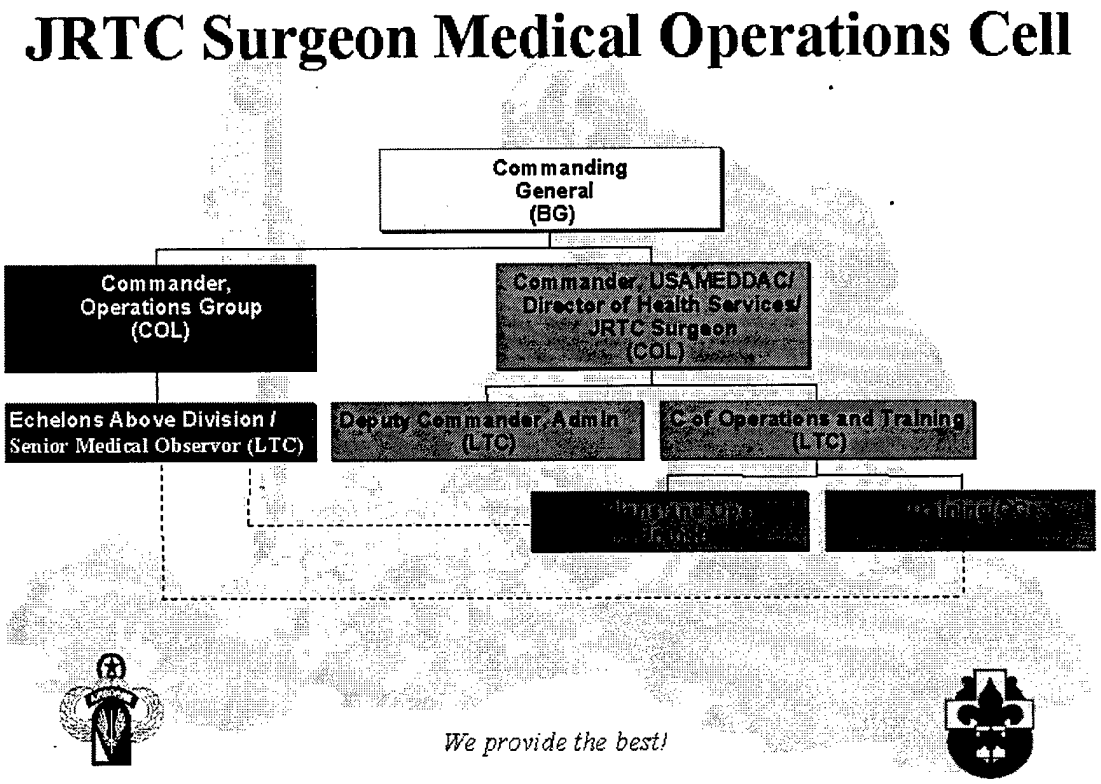


Figure 23. The organizational diagram above depicts the initial concept for the alliance between JRTC and BJACH. The coordination for this alliance is still in progress.

Related Diversification- Acquisition of the 36th Medical Detachment (Air Ambulance)

Coupled with this concept is the attachment of the 36th Medical Detachment (Air Ambulance) to the hospital after its conversion to a non-deployable medical evacuation unit. The intent of incorporating the new detachment under the hospital is to link the organization closer to the community and to JRTC by providing additional evacuation support. By diversifying the mission, BJACH further differentiates itself from the rest of the facilities in the Department of Defense and links itself to the JRTC training mission more effectively. The approved staff action prepared by the author is Appendix K.

Chapter 5-Products Associated with the Strategic Plans

The completion of the strategic analysis and development of strategies segues into the development and acquisition of associated products. Chapter 5 provides the overview for each of the management products.

Products Associated with the Strategic Plans

The BJACH reengineering plan hints at the requirement for some specific management products. Six of these necessary products provide the focus of the next several chapters.

*Product 1 – "Bayne-Jones Outpatient Model." This product is a stochastic simulation for determining the efficacy of reengineering efforts. This product supports decision-making for the Wellness and Readiness Center and Company concepts and future reorganization. By leveraging a data-driven decision support simulation, BJACH's Executive Council can logically determine the best course of action under uncertainty before implementing any change. Additionally, this model provides a basis for determining a capitated rate for funding the clinics and predicts changes to usage and capitation based on empanelment.

*Product 2 – "Bayne-Jones Army Community Hospital Web Site." The BJACH web site provides information on health and wellness, TRICARE, the Joint Readiness Training Center Surgeon's Office, etc. The web site addresses marketing and information sharing weaknesses described previously.

*Product 3-"The BJACH Internet Patient Scheduling System," (IPASS). The IPASS is an interface for patients to schedule routine or well appointments without telephoning the hospital. This product allows patients to have more control over their appointments.

*Product 4 – "The Patient Advocate." This 32-bit computer program (shared over the network) tracks patient complaints and compliments. This computer program serves to address the weakness in patient satisfaction identified in the situational analysis. By tracking specific provider, system, quality, etc. areas, the program allows for the conversion of raw data into information for use by senior decision-makers.

*Product 5 – "The Morning Ritual." This 32-bit program tracks morning report data (especially JRTC diseases and injuries) and is provided to the Executive Council daily. This computer program addresses a weakness identified in the situational analysis: there is currently no method for gathering and analyzing JRTC epidemiological data.

*Product 6 – "The Command Health Status Report." This 32-bit computer program addresses the problem of tracking readiness and health promotion. As stated earlier, Fort Polk does not have a method for quantifying the health of soldiers or other beneficiaries. As part of the prevention strategy, the Command Health Status Report is critical.

Chapter 6-Product 1, The Strategic MedModel®

The strategic analysis identified several initiatives for techno-structural reengineering including the development of the WAR Center and WAR Companies. Product 1, the strategic MedModel® simulation, provides the Executive Council a decision support tool for evaluating this business process reengineering effort. The simulation provides decision support for empanelment options, capitation rates, capacity in other outpatient clinic areas, etc. This strategic model is the baseline platform for future strategic decision-making initiatives and is a required component for determining optimal staffing for the proposed reengineering and future efforts.

Why Use Modeling

Thomas Cummings and Edgar Huse (1989) suggest that Organization Development (OD) can help organizations achieve greater effectiveness. In OD terminology, Bayne-Jones will rapidly undergo a first order (techno-structural), second order (performance program-oriented), and third order (specific cycle of activity-based) change (Cummings and Huse, 1989). Only powerful executives can drive this type of revolutionary change. The change can be successful if congruent with the corporate culture and if the change occurs so rapidly that it does not get mired in politics, individual resistance, or other forms of inertia (Tushman, Newman, and Romanelli, 1986).

Scientific techniques for evaluating and instituting organizational change of this magnitude vary widely. Utility matrices are useful techniques for evaluation of known data. Stochastic modeling, however, is more applicable for organizational development research as it accounts for the probabilistic nature of future events and allows "what if" analysis (MedModel® [On-Line], 1997). Modeling important aspects of health care

allows the researcher to experiment with different operating strategies and designs to optimize the results (MedModel® User's Guide, 1996).

Organizational modeling is not a new concept. CorpViz is one of several corporations which design and use software-based, organizational process models for this express purpose (Organizational Modeling [On-Line], 1997). Currently, the Navy is designing a stochastic organizational model for predicting supply requirements (Operations Research in Theater Medical Modeling [On-Line], 1997). The entire Department of Defense medical system has used probability-based modeling in health care planning for years with software tools such as LPXMED (External Logistics Processor, Medical) (LPXMED, 1997). LPXMED is a course of action analysis tool; it allows modeling of several different courses of action and provides feedback about potential outcomes.

In essence, modeling provides the strategic planner a tool for decision-making under uncertainty. Although simulation is not the only tool, it does provide the ability to analyze courses of action without implementing them first.

The Layout of the Simulation Process

As mentioned above, simulation is simply a tool for management analysis. Before development of any simulation, however, an organized plan is required. Figure 24 represents the basic schematic used to develop the strategic MedModel® simulations. This schematic is also the roadmap for this chapter.

Simplistic Flow Chart for Simulation Model

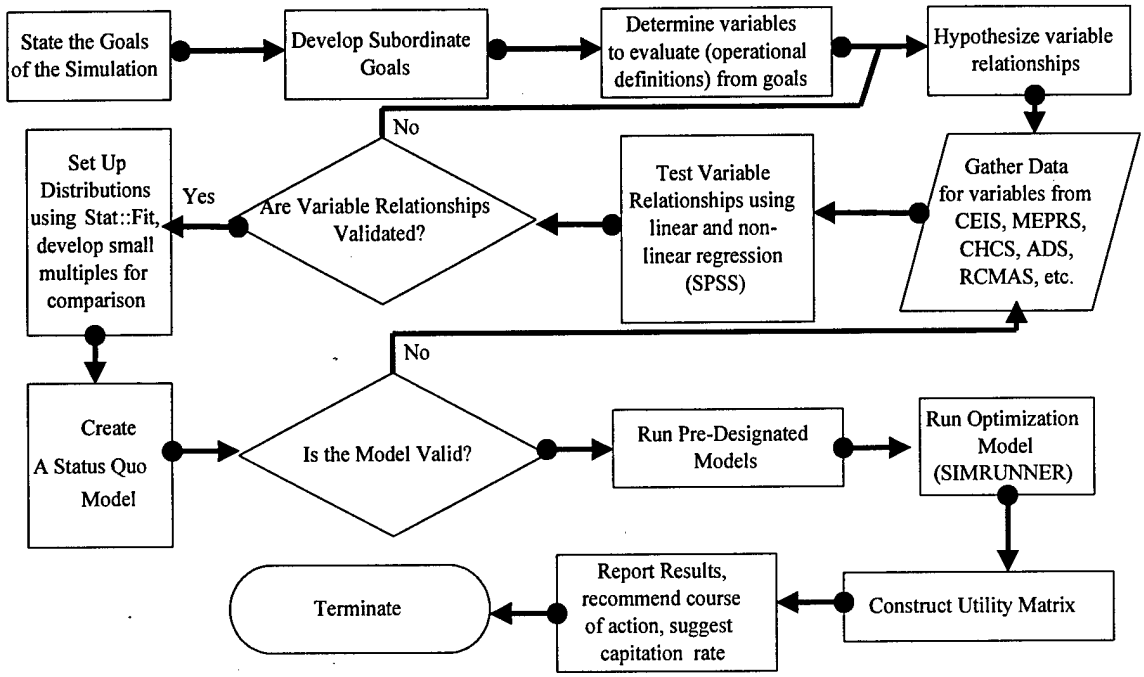


Figure 24. This chart illustrates the basic flow for the development of Product 1.

State the Goals and Develop Subordinate Goals

The first two steps in the simulation flow chart include establishing the overall goals and subordinate goals. The purpose of Product 1 is to optimize the effectiveness of business processes for BJACH in support of the WAR Center reengineering efforts. Effectiveness as defined by Ivancevich and Matteson (1996, p. 690) "refers to the optimal relationship among five components: production, efficiency, satisfaction, adaptiveness, and development." Stated as a linear programming equation, the purpose is: Optimize Effectiveness (E), where E = f (production) + f (efficiency) + . . . f (development). Appendix L reflects operational definitions; however, the essential variables of interest

were selected by senior hospital decision-makers and are provided later. Table 5 provides a listing of the subordinate goals, the data sources, and limitations.

Table 4. This table lists the goals, data sources, and limitations of Product 1.

Objective	Data Source	Limitations
Establish current visit rates per day per clinic	MEPRS workload data for last year	MEPRS is not accurate
Establish distribution of visit lengths per clinic visit, wait times, inter-arrival times	Empirical data collected	Data collected for only one primary care area
Establish arrival cycles	Hours of operation and CHCS End of Day Reports	Arrival cycles are estimates only
Establish distribution of provider contact time by clinic	Empirical data collected by observation	Data collected for one primary care clinic only
Establish distribution of cost per clinic visit by clinic type and rolled up	Distribution of cost per patient visits from MEPRS	Costs are stepped down using MEPRS, are inaccurate and are actually semi-variable
Establish number of eligible beneficiaries	Empirical data from Department of Defense data systems	Department of Defense data systems disagree
Estimate effect of increased / decreased workload on cost of clinic visits	Empirical distribution based on regression analysis	MEPRS data may be inaccurate
Determine a capitation rate for funding outpatient clinics	Cost per beneficiary (+ margin or – withhold)	Capitation rate does not account for specialty care and is a partially-blended variable cost
Determine provider usage time	Provider–patient contact time / provider availability time	Usage time does not account for other than patient-contact time
Determine impact of Health Promotion Nurses on cost (distribution)	MEPRS data and literature	Reality may differ from estimates
Determine visit changes associated with additional Health Promotion Nurses	Assumption of generation of workload	Assumption may be flawed
Determine feasibility of courses of action considered	Run simulation with variables set to match courses of action	Not all variables evaluated
Optimize staffing, capitation rate, and provider utilization	Completed simulation	All models are wrong

Determine Variables to Evaluate from Goals

After establishing the purpose and subordinate goals, variables and parameters of the simulation require clear articulation. Table 5 provides this delineation.

Table 5. The table below lists both the variables and parameters of the model and their definitions.

Variable/Parameter	Type	Definition
Patients by clinic and totaled	Dependent and Independent	Number of patients seen (distribution-based)
Cost by clinic and totaled	Dependent	Cost (distribution-based) by clinic and total cost
Clinic visits based on population (scheduled and walk-ins)	Dependent	Total visits (population * empirical rate) – scheduled template visits = walk-in visits
Patient type	Distribution-based constant	Reserved for future strategic modeling
Average provider usage by clinic	Dependent (calculated)	Provider-patient contact time / available time
Capitated rate by clinic	Dependent (calculated)	Cost / number of beneficiaries
Health Promotion Nurses (HPNs), FP	Independent (manipulated)	Number of HPNs assigned to Family Practice Clinic, Parameter used for optimization
Health Promotion Nurses, WAR Company	Independent (manipulated)	Number of HPNs assigned to the WAR Center, Parameter used for optimization
HPN clinic visits, FP	Independent (manipulated)	Number of HPN clinic visits for the FP clinic
HPN clinic visits, WAR Company	Independent (manipulated)	Number of HPN clinic visits for the WAR Company
Number of providers assigned to FP	Independent (manipulated)	Self explanatory, Parameter used for optimization
Number of providers assigned to WAR Company	Independent (manipulated)	Self explanatory, parameter used for optimization

Hypothesize Variable Relationships

The next step in the simulation flow chart is the development of hypothetical variable relationships. This part of the simulation development is essential to validity and reliability. Some variable relationships are testable; other linkages must pass the face validity test.

The linkage between arrivals, population, staffing, provider usage, and cost variables for this model is critical. If the linkages are accurate, manipulation of one of the variables will result in appropriate changes in the other variables. Table 6 illustrates the hypothesized relationships. Some of these relationships are mathematical, while others are hypothetical relationships based upon existing distributions.

Table 6. Color-coding illustrates the important relationships between variables. NOTE: Cost per visit is empirically a function of the number of visits as discussed later.

# of arrivals = historical arrival rate * empaneled beneficiary users *(hypothetical, assumes no difference in beneficiary population, not tested)*
# of providers on-hand = authorizations – "down" quantity *(mathematical)*
MEPRS cost = # of arrivals * cost per visit *(mathematical)*
variable cost per provider = ((MEPRS cost / # of providers on-hand) *(mathematical)*
cost per visit = (# of arrivals) * (traditional number of providers – # of providers on-hand) *(hypothetical, assumes cost per visit is a function of number of arrivals and a change in the number of providers, tested)*
provider usage = # of arrivals * contact time / possible time *(mathematical)*

Two hypothetical relationships are visible in Table 6. The first hypothesis (number of arrivals is a function of empaneled beneficiaries) is not tested but has face validity. Differences may exist in the health of the populations empaneled to different teams; however, the impact of these differences should be relatively minor assuming empanelment is based upon demographics. The remaining testable hypothesis is provided: Ha - The cost per visit = f (number of arrivals) * (change in on-hand providers from baseline). This hybrid hypothesis blends departmental costing with a process costing adjustment (Finkler, 1994). Empirical data exists on cost per visit and number of arrivals; however, no empirical data is available on the relationship of the number of providers and cost per visit. Nevertheless, the second part of the equation passes the face validity test, since military accounting steps down personnel costs.

Gather Data for Variables

The fifth step in the simulation flow chart requires gathering the data for testing variable relationships and for future use in distribution development. The information leveraged throughout the simulation stemmed from several sources. First, the Chief of Clinical Support Division at BJACH provided empirical observations for the primary care areas in his analysis of the Bayne-Jones Army Community Hospital Family Practice Clinic. The Department of Defense computer systems - Composite Health Care System (CHCS), Military Expense and Personnel Reporting System (MEPRS), Ambulatory Data System (ADS), Corporate Executive Information System (CEIS), and Resource Case Mix Adjustment System (RCMAS) served as the secondary data sources for the simulation. MEPRS data provided the basis for testing the relationship between cost per visit and number of visits. Data quality issues in Department of Defense computer systems appear

in Table 5; however, these systems are the basis for decisions at all levels of the military medical system. The model reflects reality as perceived by external analysts.

Test Variable Relationships

Step six of the simulation flow chart requires the testing of hypothesized relationships. Appendix M provides complete linear and non-linear regression of number of visits on cost per visit. Primary care cost per visit is a function of the number of visits, so the simulation uses a two-way distribution for this relationship. However, the null can not be rejected for emergency care, and so the model uses a one-way distribution. Figure 25 illustrates the relationships.

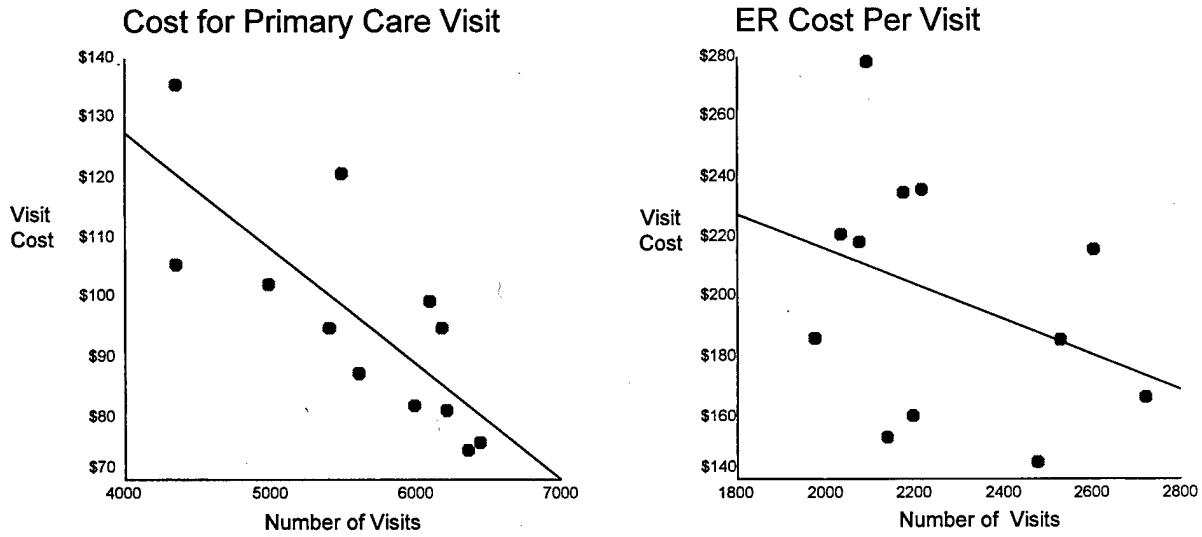


Figure 25. Scatterplot models of primary care cost (left) and emergent care cost (right) based on visits suggest divergent solutions. The primary care model reflects linearity over the relevant range, whereas the emergency room model does not.

Linking on-hand staff changes to cost per visit (the remainder of the hypotheses) was artificial. Each provider was attributed a percentage of the base-line cost; therefore, as providers were removed, costs declined accordingly. Although flawed, this method

did provide a simple method for calculating the contribution of providers to the cost of the operation. Reduction in workload partially offset the reduction in cost of operation by removal of a provider.

Set Up One-Way Distributions

The eighth process step in the simulation flow chart is the development of one-way distributions (usable formulas) using Stat::Fit® software. Stat::Fit® is a hypothesis-testing program, which tests a single variable against potential distributions (or formulas). Stat::Fit® provides several inferential statistics to determine if the variable is significantly different from the specific distribution and ranks distributions by the least error sum of squares. For a distribution to be appropriate, it can not be significantly different from the actual data. In the case of the strategic MedModel®, Chi Squared served as the standard inferential test, although Kolmogorov-Smirnov and Anderson-Darling statistics served as redundancies. Although Chi Squared is an asymptotic test and is valid only when the number of data points is significant, Law and Kelton (1991) and Stuart and Ord (1991) suggest it is valuable in the comparative sense. In order to "lump" data, this researcher selected the automatic mode of Stat::Fit®, which uses the minimum number of intervals without losing information ($k = (2*n) \wedge (1/3)$). Sturges Rule ($k = 1 + 3.3222 \log n$), which is an empirical rule for assessing the desired number of intervals, did not add value. Calculated, no-difference distributions for cost, arrivals, patient-provider contact, etc. served as the mathematical engine for all simulations. NOTE: Inter-arrival times (which are important for patient wait calculations) formed a table, not a distribution, for inclusion with the model. For this strategic model, inter-arrival times are less important than visits per population, cost per visit, provider usage,

and cost per beneficiary. Small multiples (Tufte, 1983) of the distributions are shown in Appendix N. Each of the distributions selected reveals no statistically significant difference between the actual data points and the selected formula.

Create a Status Quo Model

Step nine, the creation of a base or status quo model, is the most difficult step because it has several subtasks and requires continual tweaking to validate the model. One of these tasks, documenting assumptions, is continuous during model construction. For convenience, the primary assumptions appear below.

*Some empirical observations from the family practice clinic are applicable to other primary care areas (required due to lack of empirical data).

* Extracting a daily mean from a monthly total using 22.5 working days per month roughly approximates reality for outpatient clinics (required due to inability to extract daily data over the relevant range without excessive manpower costs).

*The Department of Defense computer systems provide relatively valid data.

*Health Promotion Nurses generate their own workload.

*The impact of prevention is nominal over the short-term and best measured through sensitivity analysis using small percentage visit decrements based upon health promotion assets available.

*Providers assigned to combat units can provide support as needed to augment the WAR Center (required assumption in determining staffing of both WAR Company A and WAR Company B).

Simplistic Model Flow Diagram

Identification of the assumptions segues into the development of a simplistic model patient and resource flow diagram. This diagram must have face validity or the simulation will lose value. Figure 26 is the model flow of patients. For each clinic, the flow remains identical. Referrals to specialty clinics may be included in additional reengineering efforts but are not present in this simulation.

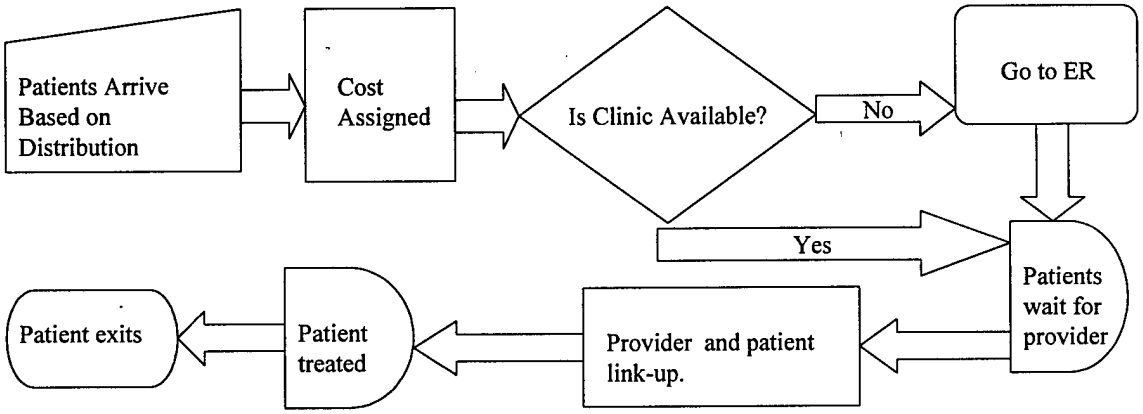


Figure 26. This flow diagram depicts the basic flow of patients through the strategic MedModel®.

The author used MedModel® as the simulation engine for Product 1. Although other simulation products are available, MedModel® is a "C" programming derivative and extremely simple to use for development. The animation functions of the program are useful for debugging and marketing but add little value to strategic decision-making.

Figure 27 depicts all outpatient clinics modeled to help the reader understand the complexity and nature of the simulation. Table 7 illustrates numerically the level of detail and the complexity of the model. Appendix O is the code used to generate the simulation model. All three components provide insight into the difficulty of developing simulations.

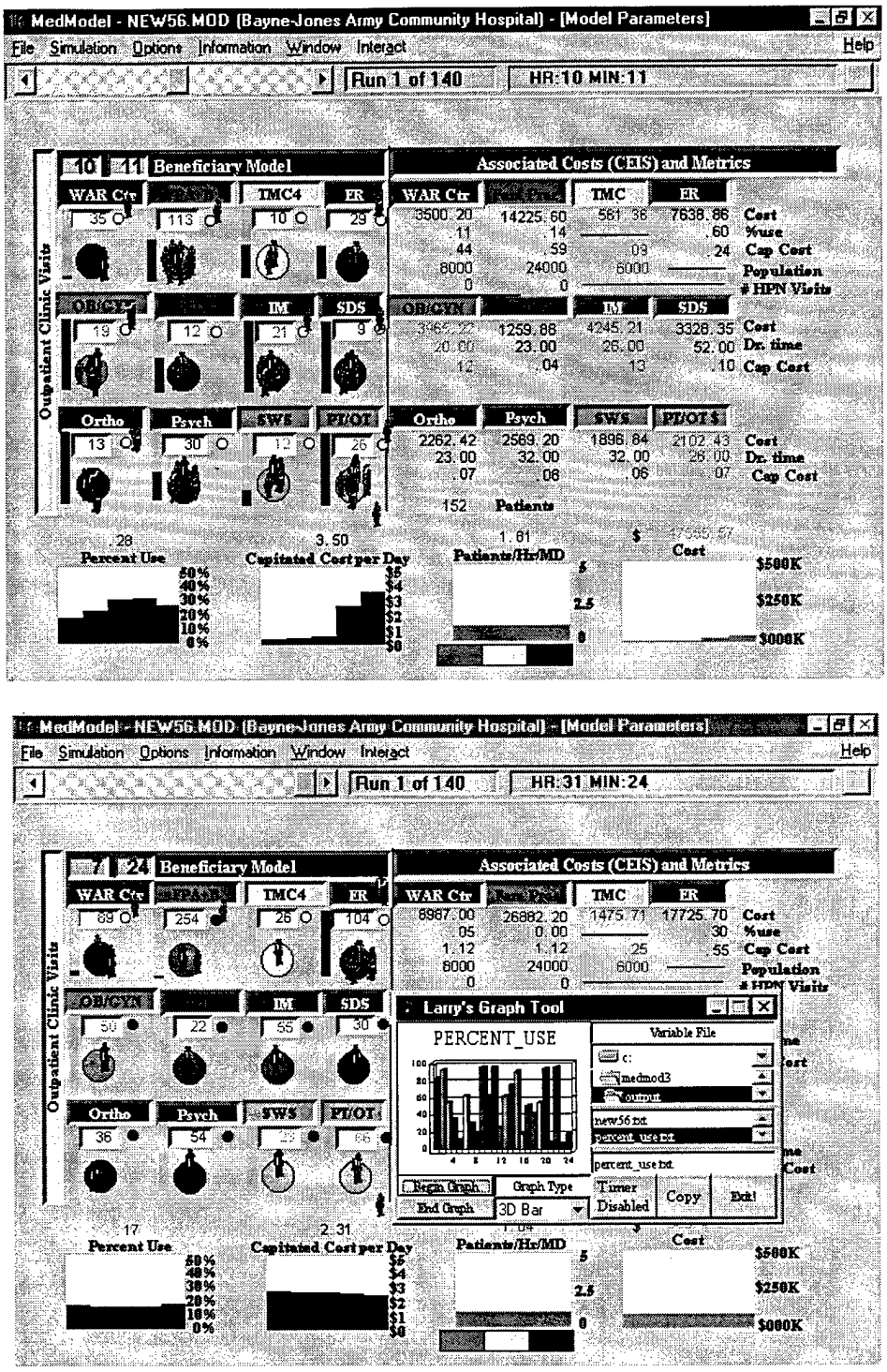


Figure 27. These screen shots illustrate the clinics evaluated by the strategic MedModel®. The graphing tool on the bottom picture is a Visual Basic program designed to instantly reflect changes in variables selected (in this case percent use of all providers). The four graphs on the bottom provided instant feedback for debugging. NOTE: Each one of the metrics depicted provided visual reinforcement for the base-line validity of the model.

Table 7. The level of detail used in development of the simulation is important to understanding the complexity of the simulation. NOTE: Clock precision for the simulation equals .01 minutes; however, this level of accuracy likely far exceeds the empirical observations and database-gathered data.

*60 named locations	*150 variables (several run-time editable)
*15 named entities	*5 macros
*1 path network with 46 nodes	*10 subroutines
*15 named resources	*3 arrival cycles
*14 separate arrivals	*2 two-variable tables
*3 different shifts	*1 user distribution
*1 attribute	*15 arrival distributions

The simulation is both terminating and non-terminating. Most of the clinics stop operation on the weekends, after 1700, and before 0800; however, the Emergency Room and Troop Medical Clinic 4 (operational only during JRTC rotations and operated by JRTC personnel) maintain 24-hour operations. These two clinics received an 8-hour warm-up period, which allowed for steady-state operation as discussed by Law & Kelton (1991). For convenience, however, the model artificially terminated at a five-day week (no weekends). This artifact simplified development of arrival tables; however, it automatically prevented annual comparison of Emergency Room and TMC statistics without separate 365-day runs. Later versions of this model will expand evaluation to seven-day weeks through extended arrival distribution tables.

Number of Simulation Runs

After programming the simulation, the next major task was determination of the number of simulation runs. This task required application of the sampling statistic, a

statistic based on the error sum of squares: $\sigma_{\bar{x}} = s / (n-1) \wedge .5$ (Emory & Cooper, 1991). An initial five-run test of one week's operation provided a standard deviation for all relevant variables. The maximum standard deviation by variable category determined the overall number of simulation runs required. In reality, the sampling statistic is totally dependent upon the acceptable deviation established by the researcher. Based upon the sampling statistic, 140 iterative processes of the simulation (700 days or 1.91 years) provided sufficient accuracy for all variables relevant to the WAR Center and WAR Company project. Table 8 (calculated using Microsoft Excel solver function) illustrates the level of accuracy attained by running the simulation for 140 runs.

Table 8. This table illustrates the deviation expected for critical variables of the simulation when alpha = .05. The acceptable deviation is determined first and then the number of simulation runs is calculated. After determining the maximum number of runs desired (based upon the largest standard deviation and tightest acceptable error), the expected deviation for all variables becomes apparent.

Variable	**Deviation accepted**			**Mean SD 5 runs**	**# of runs**
Total cost	$	1,278.40	ea week	7744.96	140
FP total cost	$	1,114.65	ea week	6752.93	140
CTMC total cost	$	369.71	ea week	2239.80	140
ER total cost	$	246.69	ea week	1494.54	140
FP provider total use		144.01	hrs / wk	872.47	140
CTMC provider total use		62.40	hrs / wk	378.05	140
ER provider total use		60.80	hrs / wk	368.34	140
ER provider avg use		0.64	hrs / wk	3.87	140
FP provider avg use		0.40	hrs / wk	2.42	140
CTMC provider avg use		0.32	hrs / wk	1.92	140
FP capitated cost	$	0.05	/ user / wk	0.28	140
CTMC capitated cost	$	0.05	/ user / wk	0.28	140
Total capitated cost	$	0.02	/ user / wk	0.11	140
ER capitated cost	$	0.01	/ user / wk	0.05	140
ER percent provider use		0.47%	ea week	0.03	140
Percent total use		0.18%	ea week	0.01	140
FP percent provider use		0.09%	ea week	0.01	140
CTMC percent provider use		0.06%	ea week	0.00	140

Is the Model Valid and Reliable?

After creating and running the baseline model, validity and reliability required analysis. The major constraints to the validity and reliability of any model include time, availability of data, the modeler's experience with similar projects, and knowledge of the system (J. Lowery, 1993). To help increase validity, the model was programmed in increments, evaluated for face validity, evaluated for statistical validity, designed to use random number streams, and "debugged" using MedModel® features. During animated model runs, an author-designed graphing tool and programmed resource graphs provided continuous feedback about variables (similar to gauges in an airplane).

Verification of the Status Quo Model (SQM) is imperative because it serves as the baseline for all future models. A simple t-test comparison of means validated the variables of interest by revealing no statistically significant differences between expected values and actual values existed. In operational terms, the hypotheses tested were:

Ho: There is no significant difference between SQM variables and empirical data.

Ha: There is a significant difference between SQM variables and empirical data.

The model appears to have statistical validity, as there is no statistically significant difference between actual data and SQM. The t - test tables for the most essential variables are located in Appendix P. This finding is critical to the acceptance of the model as valid. Table 9 is a summary of the t - tests.

Table 9. Results of the t-tests for specific variables verify the no-difference hypotheses.

Variable	Predicted mean	p-value
Arrivals, FP	233 per day	.99, not significant
Arrivals, CTMC	77 per day	.86, not significant
Arrivals, ER	69 per day	.75, not significant
Cost per visit, FP	$96.60	.82, not significant
Cost per visit, CTMC	$94.85	.79, not significant
Cost per visit, ER	$171.30	.59, not significant
Average wait time	18.9 minutes	.66, not significant

Conduct Simulation using Alternate Processes

After completion of validation, the next step in the simulation process is running and evaluating pre-designated models. For BJACH's reengineering, the organization analyzed three courses of action. The first model mimics the status quo. The second changes the staffing and beneficiaries assigned to simulate the adoption of the WAR Center and WAR companies. The third model simulates closing the Troop Medical Clinic, combining all providers and population under the parameters and conditions set for the Family Practice clinic. The models are termed "SQM" for status quo model, "WRC" for the WAR Center model, and "NEW" for adopting the WAR Center by combining the CTMC with Family Practice.

Initial Model Parameters and Variable Values

Parameters for the models were set according to Table 10. NOTE: the number of beneficiaries is actually the number of beneficiary *users* including JRTC rotational troops. The number of *total eligible* beneficiaries is also approximately 32,000 *not* including JRTC troops (J. Roberts, personal conversation, February 1998).

Table 10. The table below describes the initial variables for each model. The number of primary care providers includes the care managers assigned to other units.

Variable/Parameter	Value SQM	Value WRC	Value NEW
# of beneficiaries assigned to Alpha Company (previously CTMC)	24,000	18,455	32,000
# of beneficiaries assigned to Bravo Company (previously FP)	8,000	13,545	0
# of providers assigned to Alpha Company (previously FP)	15	12	22
# of providers assigned to Bravo Company	7	10	0
# of Health Promotion Nurses assigned to Alpha Company	0	3	6
# of Health Promotion Nurses assigned to Bravo Company	0	3	0

Results and Discussion

Complete analysis of SQM, WRC, and NEW revealed significant differences between the options. A simple utility matrix using operational definitions and specific criteria requested by the organization suggests NEW is the superior choice for optimization. Cognitively, this result is congruent with the concept of economies of scope. Mathematically, the result is convincing as well. Table 11 is the comparison of each Course of Action (COA), while Figure 28 provides a graphical representation of the patient status under each course of action. The comparison provides non-weighted metrics of specific interest to the BJACH Executive Council.

WRC was sufficiently similar to SQM to require no reprogramming or recalculation of distributions. Instead, interactive parameters and variable changes provided the necessary interface. The NEW model, however, required additional work. Recalculated distributions for arrivals and a global, one-way cost distribution combining Family Practice and TMC costs provided the engine for driving the simulation. The

NEW model does not evaluate estimated cost savings from personnel reductions and creditable turn-ins. These savings should be significant as described earlier.

In terms of provider utilization and anticipated savings, NEW is the clear choice; however, it ranks second to the status quo (SQM) for capitated cost, percent of provider utilization, and patient wait. The WRC option placed last in all categories but one: increasing health promotion capability.

Analysis of the model results suggests the increase in patient load generated by health promotion nurses will increase costs significantly. Under a fixed budgeted environment, however, allocation of costs is directly related to the amount budgeted to the medical treatment facility. Simply stated, the capitated cost, although useful for providing a base-line capitation rate, is probably overstated.

Table 11. The utility matrix below provides definitions, ordinals, and weighted values for evaluation criteria. These criteria stem from the operational definitions and Executive Council directives.

Utility Matrix (Lower is Better)

COAs	PCM Visits / # of staff	Capitated cost	% Use of Providers	% Patient Waiting	Increase in HP	Anticipated savings	
Definition	# of FP and CTMC visits / # of assigned staff	dollars per each user beneficiary	percent of time providers engaged in care	% waiting	increase in number of health promotion nurse	estimated dollars saved per annum in manpower	
Values	(Production)	(Efficiency)	(Development)	(Development)	(Vision)	(Financial)	
SQM	41.36	$ 2.87	13.58%	12.46%	0	$ -	
WRC	73.32	$ 3.33	22.83%	14.39%	6	$ -	
NEW	87.13	$ 3.25	14.64%	13.79%	6	$ 240,000.00	
Ordinals							**Sum**
SQM	3	1	1	1	3	2.5	11.5
WRC	2	3	3	3	2	2.5	15.5
NEW	1	2	2	2	1	1	9
Weights	1	3	2	2	3	2	**Sum**
SQM	3	3	2	2	9	5	24
WRC	2	9	6	6	6	5	34
NEW	1	6	4	4	3	2	20

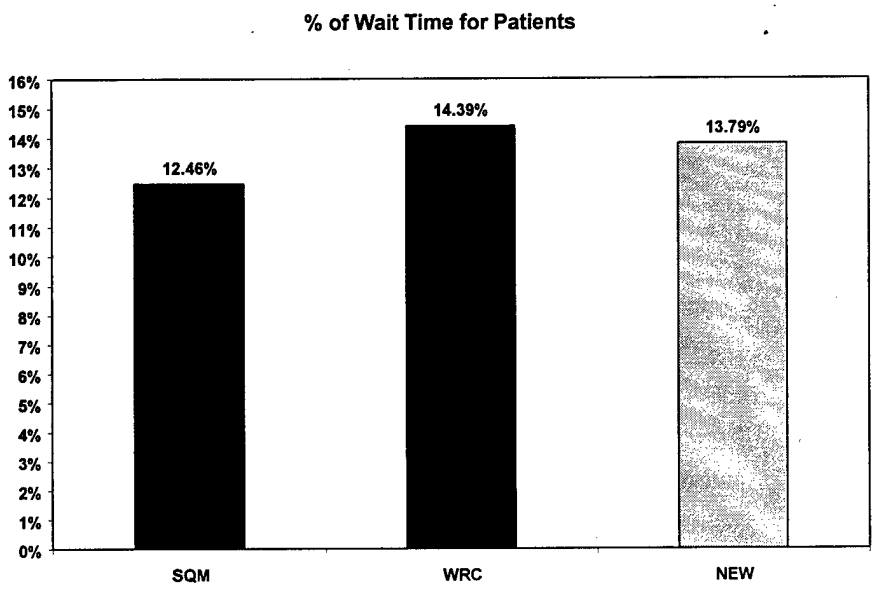


Figure 28. Depicted are the waiting percentages for all three courses of action. NOTE: the MedModel® program uses three dimensional pie graphs for display of this information. These graphs provide no dimensionality or resolution.

Limitations: Weaknesses in the Simulation Software

Although MedModel® is a sophisticated tool for simulation, the program and its associated programs are not perfect. An optimization simulation run using SimRunner® (an optimization program associated with MedModel®) is not possible for this strategic simulation due to limitations in both MedModel® and SimRunner®. Simply stated, resource quantities (e.g., staffing) can only be manipulated by adjusting the "down" quantity (those unavailable for work.) The down quantity can be manipulated by adjusting parameters during simulation runs; however, the parameter input for down time quantities is a text-based input range (e.g., 13-15) while the SimRunner® program requires numeric input for manipulation. Currently, MedModel® does not support programmable options for adjusting quantities of resources (e.g., the use of "For / Next" loops or "Do / While" loops).

Another problem with the simulation software is its inability to accept distributions for determining resource quantities. In strategic simulation, this capability is important. The author, in this case, would have established distributions based upon the number of providers in the clinic over a one-year span. Using this distribution would have allowed for variations in staffing due to deployments, personal leave, temporary duty, etc. Without this capability, only one number represents the availability rate (e.g., 80%).

Finally, MedModel® provides a costing function; however, manual programming of this feature is superior. The current program does not allow distributions for costing; it only allows fixed values. At the strategic level, cost distributions are more valuable than estimating exact values for activities (Activity-Based Costing) or processes (Process Costing). Hybrid accounting using distributions is more useful for collecting global cost information.

Limitations: Data Quality and Generalization of the Results

As described previously, this simulation has significant limitations. Data quality and data filtering are the most significant shortcomings. The quality problem is universal in the Department of Defense; however, strategic and operational decisions at all levels reflect information from the same data sets used in this research. Data filtering is an issue because the MEPRS costing database does not separate variable from fixed costs automatically; therefore every cost associated with this model includes fixed and variable components (J. Roberts, personal conversation, May 1998). For purposes of capitating WAR Companies, the calculated capitated cost is applicable as the companies must pay their portions of overhead, civilian personnel, etc.

Other organizations should not attempt to generalize the results of the simulation outside of BJACH; however, the same simulation methodology is applicable for evaluating systems and process changes from a strategic level. At the United States Army Medical Command and Great Plains Regional Medical Command level, this type of simulation is not just important, it is vital to strategic decision support processes.

Discussion-Relevance of the Results

Implementation of the results of the simulation is ongoing; however, the capitated rate requires verification before application. With the advent of Enrollment-Based Capitation (EBC), the MTF will receive funds based upon TRICARE Prime enrollees. By implementing this EBC down to the WAR Company levels, the facility can share risk with its production entities. Simply stated, providers will have the incentive to manage the health of their populations appropriately.

As a strategic decision-support tool, the model has merit. Although flawed in several ways, the simulation serves as a baseline for creating even more useful strategic decision support tools.

Beyond this analysis, the Strategic MedModel® will serve as a tool for additional outpatient analysis and reengineering efforts as it identifies productivity and resourcing issues in each outpatient clinic. The value of this model is not in this strategic analysis alone, but in its flexibility to predict the impact of changes to any outpatient clinic. Because of the many variables evaluated, the simulation will analyze other aspects of organizational and process changes beyond those selected for this reorganization in the future. In short, the model provides a good baseline for techno-structural and process interventions.

Chapter 7-Product 2: "Bayne-Jones Army Community Hospital Web Site"

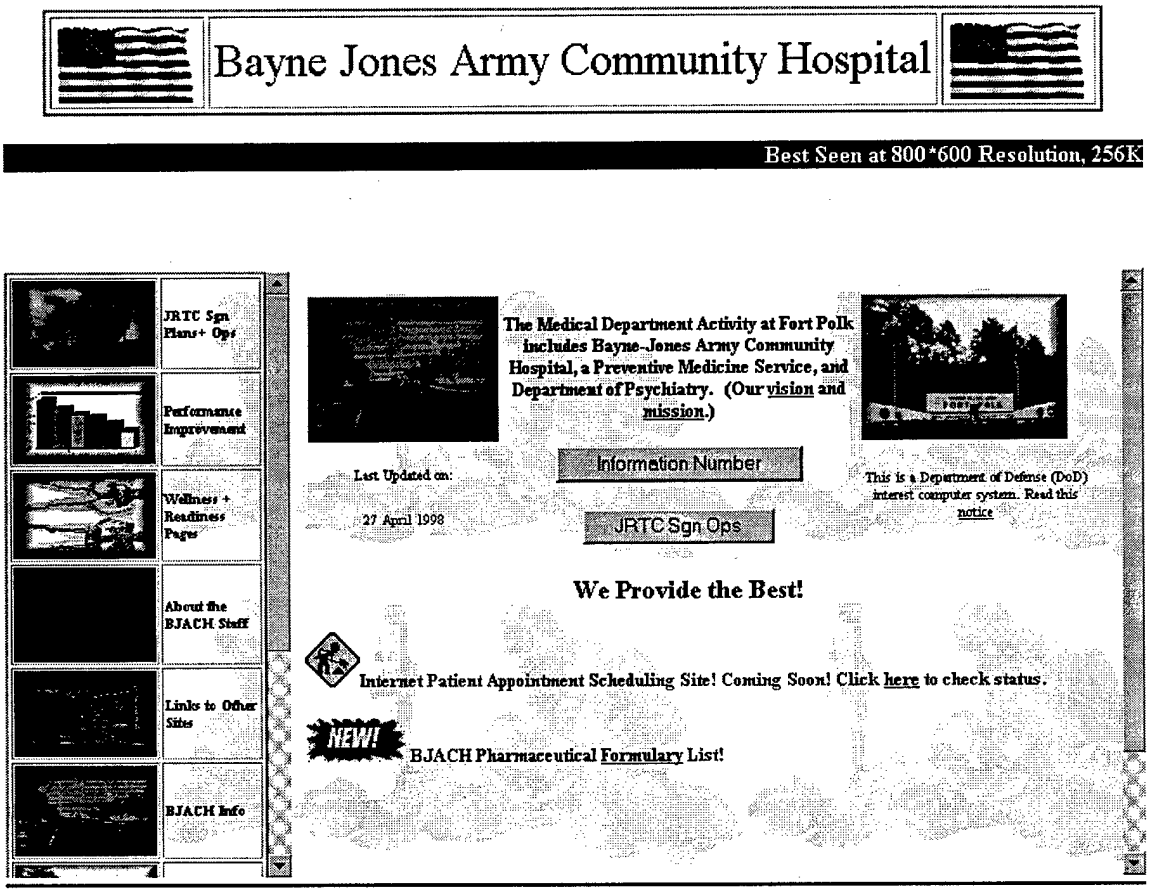


Figure 29. Above is a picture of the BJACH web site as of 1 May 1998.

While Product 1 provided an internal decision support tool, Product 2 provides an external marketing and communication tool via the Internet. The strategic plan suggested the need for a web site, which would not only market the hospital to the community, but also provide information about wellness and readiness and the Joint Readiness Training Center. Product 2 (Figure 29) is the end state of this vision.

The Strategic Problems Addressed by the BJACH Web Site

Product 2 supports the strategic vision of Bayne-Jones Army Community Hospital in health promotion, wellness, marketing, etc. As part of the WAR Center concept,

wellness and readiness web pages providing the local community education and information resources are required. Established at http://www.polk.amedd.army.mil or http://bjach.polk.amedd.army.mil, the BJACH web site serves several purposes: marketing, education, prevention, health promotion, readiness, and local community interface to the hospital through electronic mail.

Development of the Site

No hospital web site existed prior to October 1997. In fact, the hospital's higher headquarters (GPRMC) had no web site, either. The initial establishment of the web server required permission of the Information Management Officer at BJACH and coordination with the Department of Defense Network Information Center (DODNIC, http://www.nic.mil). The hospital received the requested domain names (Internet addresses) and had these names assigned to the Internet Protocol (IP) address of the appropriate computer.

After the server received its name assignment from DODNIC, web server software from Microsoft served to establish a selected directory as the web site. The default web page linked appropriate HyperText Markup Language (HTML) web pages logically.

All web pages were designed using shareware software trials, licensed word-processing software, freeware editors, and manual coding. The organization had no costs associated with the establishment of this site except for man-hours. Web server software and HyperText Markup Language (HTML) script software are available through several sources on the Internet.

After establishing the site, global and local advertising became an important task. Globally, major Internet search companies list the BJACH Web Site, including Yahoo (www.yahoo.com), Alta Vista (www.digital.altavist.com), Lycos (www.lycos.com), etc. Locally, the Fort Polk newspaper and television channel provided information to the community. There was no cost associated with any advertisement.

Content of the Site

The basic content of the BJACH Web Site includes six areas focused on specific weaknesses identified in the strategic analysis. The six areas provided and the associated weakness addressed are depicted in Table 12.

Table 12. The table below illustrates the basic content of the BJACH web site. Note the primary purposes of the site.

Web Server Products

Web Site Link	**Strategic Weakness Addressed**
JRTC Surgeon Plans and Operations Link	Communication with rotational units
Wellness and Readiness Links	Prevention and education of customers
Performance Improvement, About BJACH Links	Strategic marketing to patient and units
Links to other site	Strategic marketing to unit customers
Internet scheduling program	Patient satisfaction with access, marketing
Software downloads	Strategic marketing

The content of the JRTC Surgeon Plans and Operations pages includes unclassified operations orders written by the author for establishing the medical link between rotational units and the hospital. Before the establishment of this web site, units deploying to JRTC could not find information on real-world medical support at Fort Polk as described previously in the strategic analysis.

The basic content of the Wellness and Readiness pages was derived from the U.S.-Army Baylor students; however, the content of each page required review, editing, and approval of physicians at Bayne-Jones Army Community Hospital. After review,

manual editing and posting was required. Personal data was minimized in accordance with Department of Army policy (Department of the Army Web Site, http://www.army.mil).

The performance improvement site is still under development, but it will reflect graphically the positive aspects of BJACH. The goal is to market outcome-based success stories, which is similar to the Joint Commission on Accreditation of HealthCare Organization's (JCAHO) new philosophy (JCAHO Web Site, http://www.jcaho.org). Marketing success to the community, education, and communication are the reasons for the "Frequently Asked Questions" and "About the BJACH Staff" links. These links provide electronic mail addresses, telephone numbers, and commonly asked information to the public.

"Links to Other Sites" and "Download Software" provide additional services to BJACH customers. The software link markets BJACH initiatives to other facilities through the sharing of some of the innovative computer-based solutions the hospital is implementing.

Current Success and Future Initiatives

Currently, the site receives between 100 – 500 "hits" per day with many more requests. A better server is required to increase performance. Figure 30 reflects the number of hits and number of requests (activation of pages) for a current four-day period. Two other Military Treatment Facilities have contacted the author for assistance.

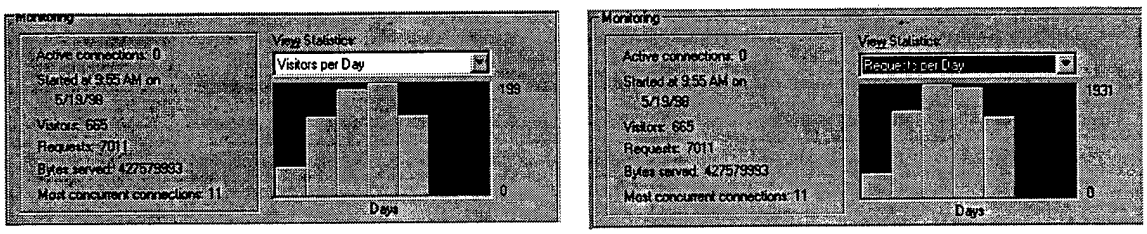


Figure 30. The number of visitors and the number of requests per day have increased since the inception of the site.

Chapter 8 - Product 3: "The Internet Patient Appointment Scheduling System" (IPASS)

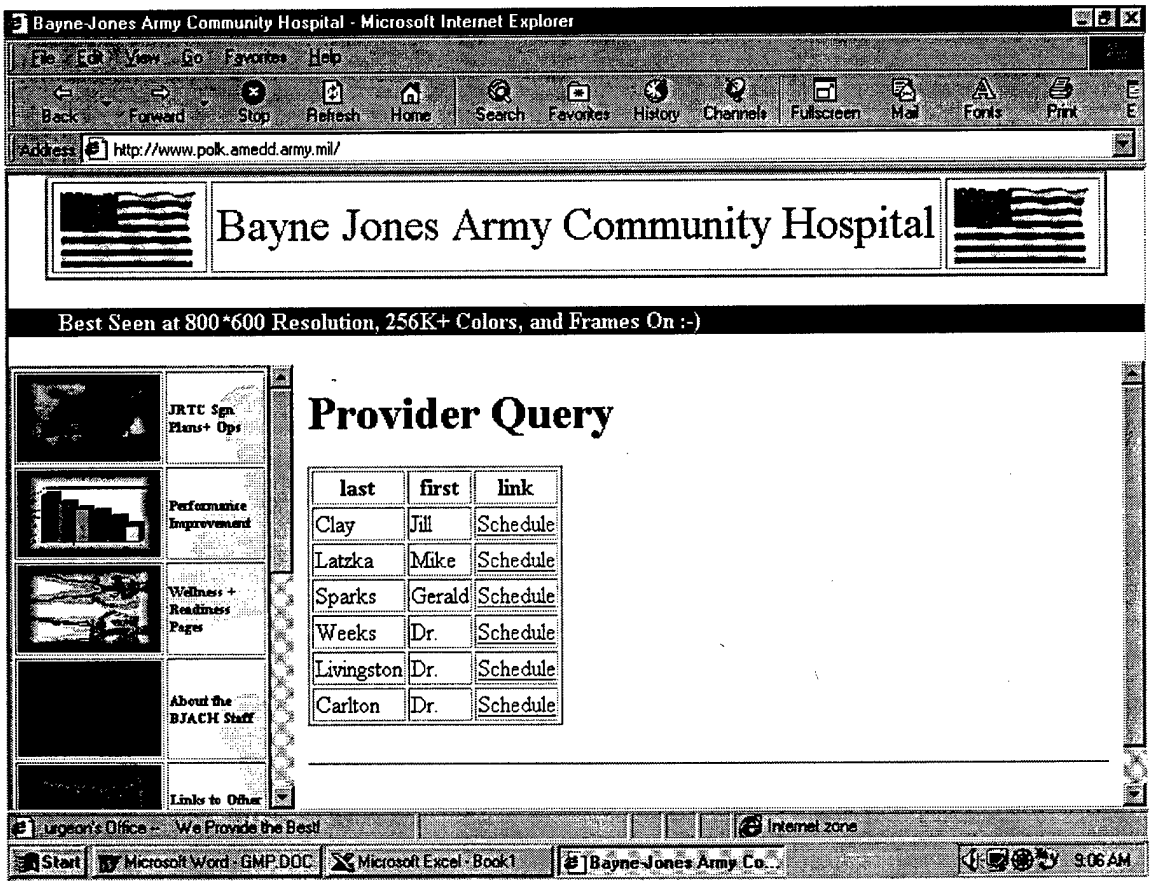


Figure 31. The picture above depicts the initial screen interface for the Internet Patient Appointment Scheduling System (IPASS).

One of the innovations suggested by the strategic plan was the ability for patients to schedule their own appointments. Figure 31 is the beta version of this innovation.

The Strategic Problems Addressed by IPASS

The strategic analysis revealed potential deficiencies in patient satisfaction with access and also suggested the need for innovative products to promote both patient education and improved satisfaction. The Internet Patient Appointment Scheduling System (IPASS) concept is the product described in the strategic plan.

Development of the System

The IPASS system uses simple Internet Protocol (IP) linked through Object Data Base Connectivity (ODBC) interface to a simple Microsoft Access database. The database consists of patient appointments reserved using "DDS" (Doctor Designated Slot), in CHCS. Figure 32 reflects the IPASS basic flowchart. The system is now operational but requires a manual interface with CHCS, certainly not an optimal relationship.

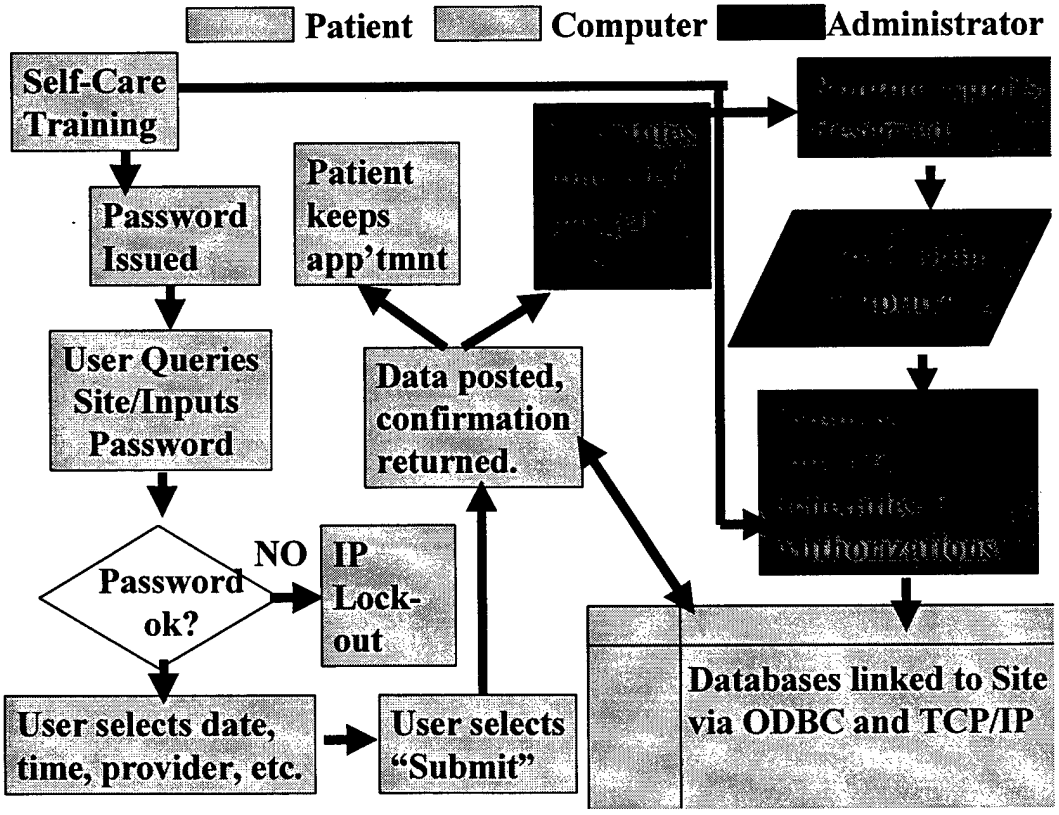


Figure 32. The basic flowchart for IPASS is simplistic yet effective.

Internet patient scheduling is novel but not completely new. Austin Regional Clinic accepts requests for appointments by e-mail (Austin Regional Clinic,

http://www.austinregionalclinic.com/index.html). The Institute for Spinal Disorders (http://www.spines.com/Institute/online.htm) also allows this interface:

Current Success and Future Initiatives

The author will present the IPASS system as a concept and an interim product to the Commander, Great Plains Regional Medical Command on 28 May 1998; however, the system is in its infancy. In the future, a bridge (either macro or contractor programmed) will be required to make the IPASS fully functional. Since the Science Applications International Corporation (SAIC) owns CHCS, SAIC must approve any CHCS bridges; however, user-programmed macros are not subject to the same requirement. Although the impact on the Fort Polk community may be negligible, the system has potential for widespread use across the Department of Defense as illustrated by queries from Air Force facilities reference the system.

Chapter 9 - Product 4: "The Patient Advocate"

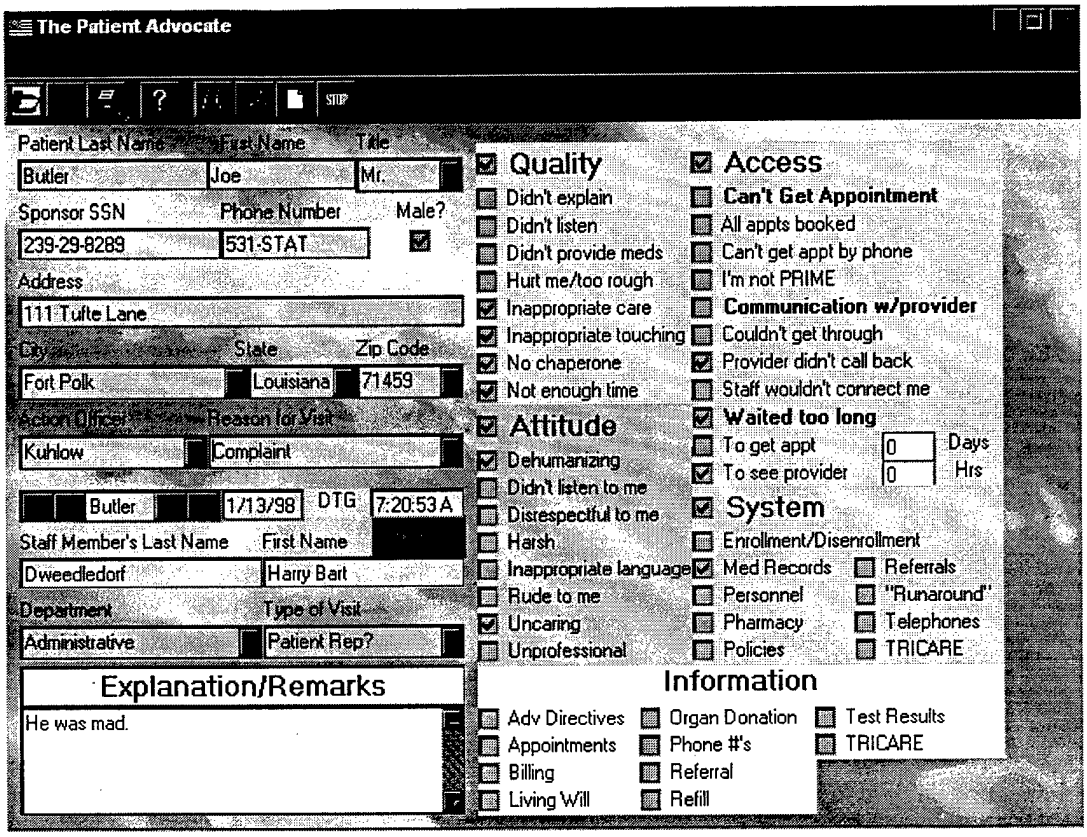


Figure 33. The picture above is the screen interface of "The Patient Advocate." End users and supervisors selected the appropriate data fields.

The strategic analysis describes the inability to capture systems and process problems affecting patient satisfaction as an issue for management. Although the Department of Defense survey provides some information, local complaint-gathering systems are necessary to isolate these problems. Griffith (1995) suggests "the only disadvantage to the use of quantitative information is the cost of collecting the supporting data. Much of this cost is hidden from the accounting system, but it is real. The solution is to make the data collection as efficient as possible." Product 4 (Figure 33) addresses the data collection and efficiency issues.

The Strategic Problems Addressed by "The Patient Advocate"

Until this February, BJACH had no systematic method for gathering data about the type and nature of patient complaints other than the monthly Department of Defense Customer Satisfaction Survey. The Patient Representatives for the hospital did not have systems in place to analyze local complaints (N. David, personal conversation, January 1998). To assist the Patient Representatives and address this strategic weakness, the Chief of Clinical Support Division requested database software. "The Patient Advocate" stemmed from this request.

Development of the Software

The software was designed through a "bottoms up" approach. The end users provided information about the type and nature of complaints and compliments and the best fields for monitoring. Visual Basic and Microsoft Access formed the engine behind a beta test version of the software. The beta test revealed some significant shortcomings, which were redesigned to meet the needs of the user and the facility. The final testing is still ongoing; however, the application is now sharable over the network and the standalone version is fully implemented.

Content of the Software

The software provides the capability to track complaints about quality, access, and attitude. Drop-down menus provide selections for reasons for visit (e.g., Congressional, patient visit, letter, etc.), compliment and information tracking, etc. Other features of the software include the capability of viewing reports prior to printing and the ability to access the database without interface through the program should the need arise. The database provides the storage; however, data analysis programs are required for

conversion of the data collected into information and interpretation of this information for the management decision-making process.

Implementation

"The Patient Advocate" is available in beta version; however, the utility of the program remains uncertain. If the Patient Representatives continue to find the interface useful and/or are required to use it, the software will do what it is designed to do: store data. The processing of this stored data requires dedication on the part of the leaders.

To date, the patient advocacy process in the hospital has received much attention. The program appears to be useful and is the basis for local complaint tracking. Further refinement of the program is ongoing; however, this innovation will likely remain in place for some time.

Chapter 10 - Product 5: "The Morning Ritual"

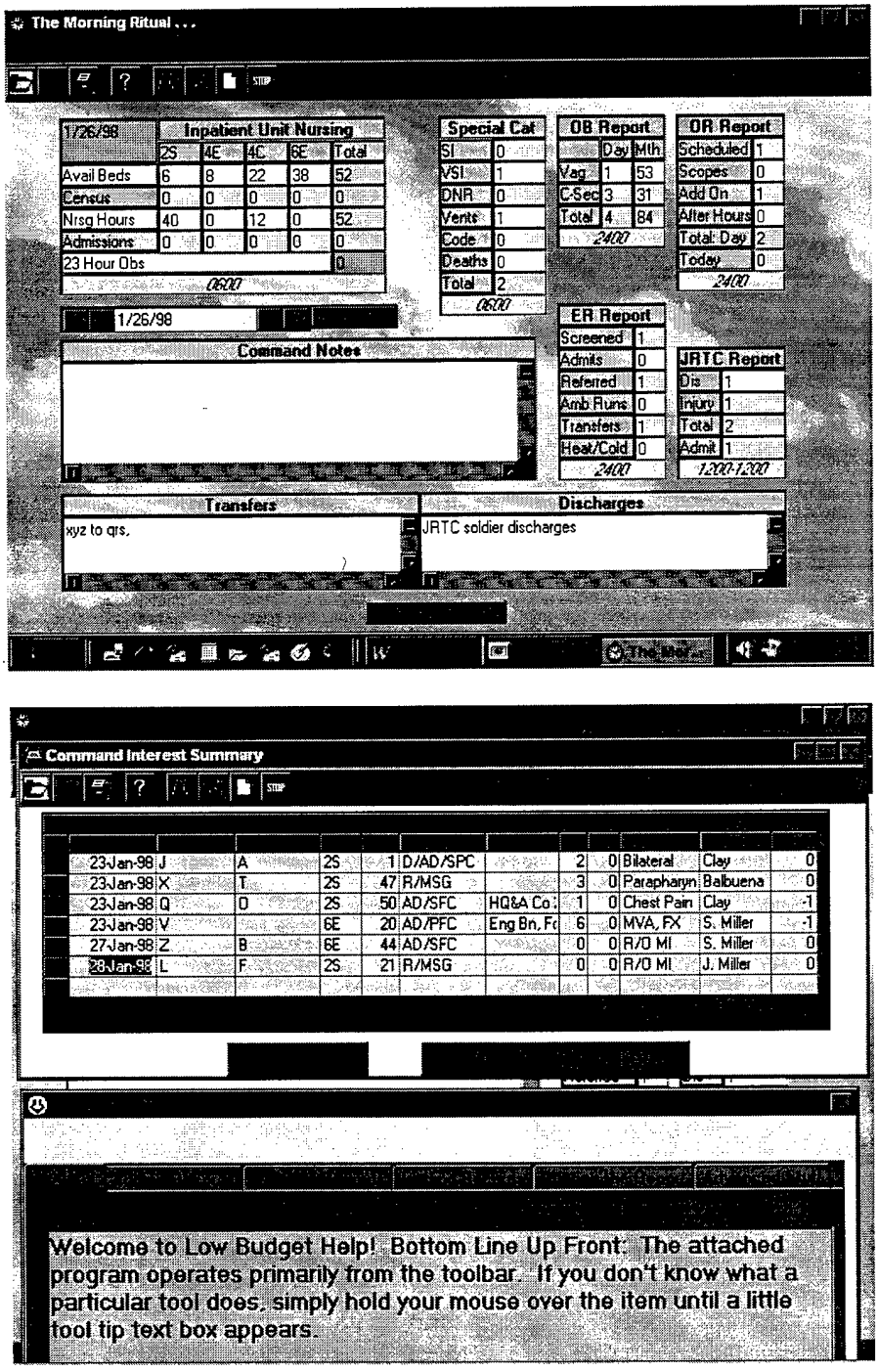


Figure 34. These screen snapshots illustrate the three basic forms of "The Morning Ritual" software. The "Low Budget Help" provides the user information on how to fill out the forms.

Health promotion and wellness requires the ability to track epidemiological data. Product 5 (Figure 34) is the beta product addressing this problem.

The Strategic Problems Addressed by "The Morning Ritual"

One of the problems identified in the strategic analysis was the failure of BJACH and the JRTC Surgeon's office to gather and maintain epidemiological data about JRTC injuries. As part of prevention and health promotion, this function is critical. "The Morning Ritual" software was designed to correct this problem. Before January of 1998, data collection was automated but not recorded (form software) and data tracking and trending was non-existent. Nursing staff recorded all JRTC injury and disease-related data on a form and filed it appropriately. Nobody analyzed this data because retrieval was too time-consuming.

Development of the Software

This software was designed using a "bottoms up" approach. The existing morning report served as the basis for development of this tool. Again, Microsoft Visual Basic and Access served as the engine for the beta test. The beta test revealed some significant shortcomings, which were redesigned to meet the needs of the user and the facility. The final testing is still ongoing; however, the application is sharable over the network with users who enter the appropriate passwords. NOTE: this application has met with some resistance, as many end users are afraid of computers. The ability to overcome this fear of change is likely a function of leadership.

Content of the Software

"The Morning Ritual" software provides fields for JRTC disease and injury tracking as well as by name injury management. Fields for tracking JRTC discharges and

statuses are available. Because the program is designed as a morning report substitute, several other data fields are tracked, which will provide the basis for future strategic planning and analysis.

Implementation

Implementation of the beta software is complete. Final release will likely occur in the summer timeframe.

Chapter 11 - Product 6: "The Command Health Status Report"

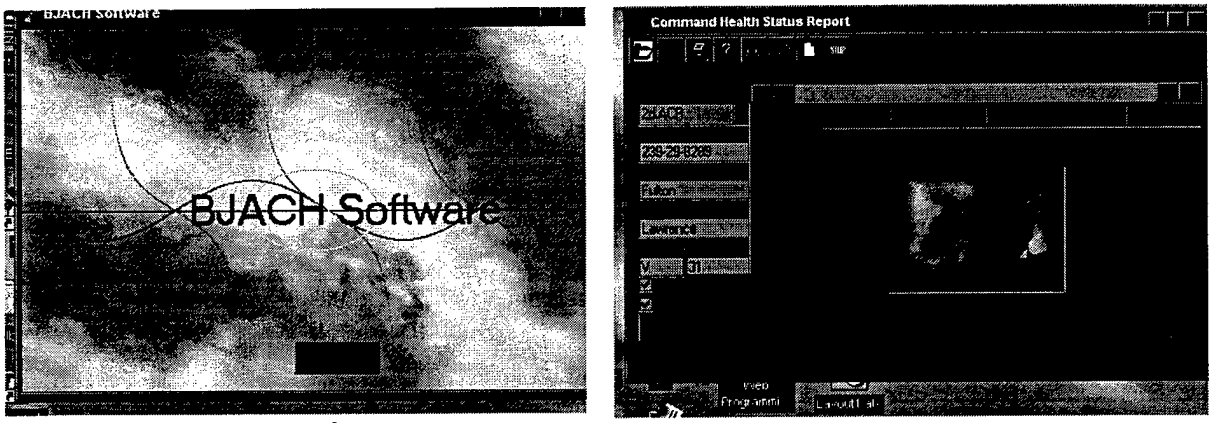


Figure 35. The pictures above are screen snapshots of "The Command Health Status Report" software.

The strategic plan pointed out the inability of BJACH to manage the health of the command because of competing, disjointed, computer solutions. None of these solutions is universally approved or fully functional. Figure 34 represents the local solution for BJACH.

The Strategic Problems Addressed by the Command Health Status Report Software

In order to implement prevention and proactively manage the health of the command, some form of patient tracking system is required. The strategic plan for BJACH requires proactive management of the population. Without an effective database, this feat is impossible. Currently, BJACH has several for managing aspects of readiness and wellness. These systems include the Medical Occupational Data System (which is supported by Medical Command) and the Mobilization Level Augmentation System (which is supported by Forces Command), but neither of these systems are fully accepted, operational, or approved (T. Baker, personal conversation, January 1998). The ability to effectively manage and monitor personnel health status requires a system built for the end user.

Development of the Software

The Command Health Status Report software is essentially an interface shell for consideration by a Process Action Team (PAT). The PAT will determine what additional requirements and needs exist and provide input to the interface and content of the program. The software has yet to be alpha-tested.

Content of the Software

"The Command Health Status Report" will eventually import Standard Installation/Division Personnel System (SIDPERS) information through manipulation by database experts. The software provides the means for tracking patient immunizations, pathology (HIV, etc.), profiles, examinations, etc. and will be expanded to include those fields deemed necessary by the prevention experts.

Implementation

Alpha testing should be conducted some time in August.

Chapter 12 - Conclusions

The ongoing strategic reengineering of BJACH requires the ability to leverage information for decision-making. Additional management products geared towards collecting, processing, and evaluating strategic data must be developed and implemented. The products provided herein, although useful, are not a complete, integrated package. The organization will continue to pursue integrated strategic management solutions.

Strategically guiding an organization through chaos requires innovation, initiative, plans, and products. Without these ingredients, an organization will stagnate in the present. Bayne-Jones Army Community Hospital thrives and will continue to thrive on potential futures and analytical strategic decision-making.

To continue BJACH's pursuit towards excellence, the strategic planning process described must continue. Although the products of strategic planning may not achieve maturity, the process prevents stagnation and assists in organizational survival. Scanning the horizon, understanding the associated risks, and planning accordingly are vital to organizational health.

This consultative project clearly reflects a work in progress. No effort of this magnitude can be fully completed in six months; however, the foundation has been set. In summary, this Graduate Management Paper has resulted in estimated savings of $240,000 per year (in civilian personnel costs alone), a lasting strategic simulation model, an Internet web site, an Internet patient scheduling system, three computer programs in various stages of fielding, and one Master in Health Administration.

Appendix A - Regression Analysis, Bed Days per 1000 Beneficiaries

(Analysis Method derived from Finstuen, 1997)

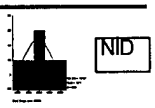
Finstuen Ten-Step (Modified) Analysis of Bed Days / 1000 Beneficiaries by Year

1. Population = Total Bed Days / 1000 Beneficiaries for BJACH, Sample = Years 1992 - 1997
2. X = Fiscal Year, nominally coded; Y = # of Bed Days per beneficiary
3. Ha: Y = f(x); Ho: Y <> f(x)
4. # of Bed Days per 1000 beneficiaries is a function of year
5. Alpha = .05
6. Descriptives

Coding for Year
1992=1
1993=2
1994=3
1995=4
1996=5
1997=6

	Y	X
Mean	386.67	3.50
Standard Error	56.25	0.76
Median	390.00	3.50
Mode	#N/A	#N/A
SD	137.79	1.87
Sample Variance	18986.67	3.50
Kurtosis	-0.31	-1.20
Skewness	-0.05	0.00
Range	390.00	5.00
Minimum	190.00	1.00
Maximum	580.00	6.00
Sum	2320.00	21.00
Count	6.00	6.00

Histogram of Y



Histogram of X

Correlation

	Bed Days	Year
Bed Days	1	
Year	-0.993073928	1

7. Inferentials

SUMMARY OUTPUT

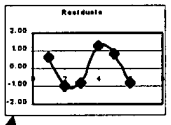
Plot of Y on X

Regression Statistics	
Multiple R	0.99
R Square	0.99
Adjusted R Squa	0.98
Standard Error	18.10
Observations	6.00

ANOVA

	df	SS	MS
Regression	1	93622.86	93622.86
Residual	4	1310.48	327.62
Total	5	94933.33	

Plot of Residuals



	Coefficients	Standard Error	t Stat	F	Significance F	Lower 95.0%	Upper 95.0%
Intercept	642.67	16.85	38.14	285.77	0.00	595.88	689.45
X Variable 1	-73.14	4.33	-16.90			-85.16	-61.13

RESIDUAL OUTPUT

Observation	Predicted Y	Residuals	Standard Residuals
1	569.52	10.48	0.65
2	496.38	-16.38	-1.01
3	423.24	-13.24	-0.82
4	350.10	19.90	1.23
5	276.95	13.05	0.81
6	203.81	-13.81	-0.85

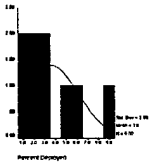
P-value	Lower 95%	Upper 95%
0.00	595.88	689.45
0.00	-85.16	-61.13

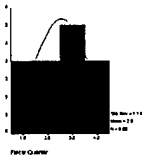
Appendix B - Decomposition Analysis of Readiness Time

The decomposition method of time series forecasting accounts for trend effects and seasonal effects by decomposing data and generating a seasonal index. This method is most appropriate for analyzing data, which has a known seasonal component (Lotfi & Pegels, 1996). Because of the inherent quarterly nature of the training and deployment cycles in the military, the presence of four seasons corresponding to fiscal quarters was analyzed.

1. Population: Percent of man-hours dedicated to readiness and training over the last year. Sample: Those man-hours specifically tracked by Operations and Training Division of the Hospital.
2. Variables: X1 - X4 = Fiscal Quarters (interval), , Y = Percent of man hours dedicated to readiness and training (ratio)
3. Hypothesis: Ha: y = f(X1) + f(X2) . . .+ f(X4); Ho: Y<> f(X1) + f(X2) . . . + f(X4)
4. Ha: Percent of man-hours dedicated to readiness and training is a function of fiscal quarter.
5. alpha = .05
6. Descriptives:

	N	Range	Minimum	Maximum	Sum	Mean		Std.	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Percent Deployed	9	7.90	.74	8.64	32.22	3.5802	.8607	2.5821	6.667	.884	.717	.398	1.400
Fiscal Quarter	9	3.00	1.00	4.00	23.00	2.5556	.3768	1.1304	1.278	-.176	.717	-1.171	1.400
Valid N (listwise)	9												

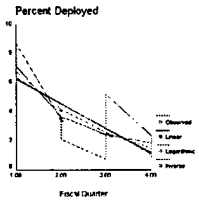
Y: 

X: 

7. Inferentials:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.735[a]	.541	.475	1.8708

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regressio	28.840	1	28.840	8.240	.024[a]
	Residual	24.500	7	3.500		
	Total	53.340	8			



Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.873	1.620		4.859	.002
	Fiscal Quarter	-1.680	.585	-.735	-2.871	.024

a. Dependent Variable: Percent Deployed

8. Reject the null hypothesis, Y = f(X1) + f(X2) + . . . f(X4)
9. R^2 = 73.5%, F{1,7} = 8.24, p = .024
10. Generalization of the results is limited due to small sample size. Decomposition revealed that the seasonal relatives are: 3d Quarter, 0.7569; 4th Quarter, 0.5466; 1st Quarter, 2.0253; 4th Quarter, 0.7585, The trend equation calculated under decomposition is: Intercept = 1.935 , Slope = 0.329. Other statistics calculated are listed below. MSE = 1.11; MAD = 0.85; Bias = -0.01; Coefficient of variation = 1.24.

Appendix C - Cubic Regression of Population per Staff Member by Year

Finstuen Ten-Step (Modified) Analysis of Population/Staff Member by Year

1. Population = Total Beneficiary Population / # of BJACH Staff, Sample = Years 1992 - 1997
2. X = Fiscal Year, nominally coded; Y = Total Beneficiary Population / # of BJACH Staff (ratio)
3. Ha: Y = f(x); Ho: Y <> f(x)
4. Ha: Total Beneficiary Population / # of BJACH Staff is a function of year
5. Alpha = .05
6. Descriptives

Coding for Year
1992=1
1993=2
1994=3
1995=4
1996=5
1997=6

	Y	X
Mean	43.013	3.50
Standard Erro	1.1103	0.76
Median	42.2307	3.50
Mode	#N/A	#N/A
SD	2.71966	1.87
Sample Varian	7.39656	3.50
Kurtosis	-1.7187	-1.20
Skewness	0.62197	0.00
Range	6.44147	5.00
Minimum	40.2676	1.00
Maximum	46.7091	6.00
Sum	258.078	21.00
Count	6	6.00

Histogram of Y

NID?

Histogram of X Correlation

7. Inferentials

Listwise Deletion of Missing Data

Multiple R	.86730
R Square	.75221
Adjusted R Square	.58701
Standard Error	1.34119

Analysis of Variance:

	DF	Sum of Squares	Mean Square
Regression	2	16.381536	8.1907678
Residuals	3	5.396396	1.7987986

F = 4.55347 Signif F = .1233

---------- Variables in the Equation ----------

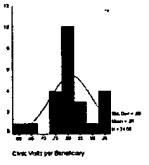
Variable	B	SE B	Beta	T	Sig T
YEAR	-57.118210	20.749312	-51.201808	-2.753	.0706
YEAR**3	.002116	.000774	50.840303	2.733	.0717
(Constant)	3652.423235	1306.884932		2.795	.0681

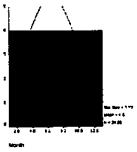
8. Do not reject the null (p =.12)

Appendix D - Decomposition of Clinic Visits

1. Population: Clinic visits per beneficiary. Sample: Visits since FY 95
2. Variables: X1 - X12 = Month (interval), Y = Clinic visit rate per beneficiary (ratio)
3. Hypothesis: Ha: y = f(X1) + f(X2) . . .+ f(X12); Ho: Y<> f(X1) + f(X2) . . . + f(X12)
4. Ha: Clinic visits per beneficiary is a function of month.
5. alpha = .05
6. Descriptives:

	N	Range	Minimum	Maximum	Sum	Mean		Std.	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Clinic Visits per Beneficiary	24	.37	.60	.97	19.53	.8137	1.784E-02	8.739E-02	7.637E-03	-.270	.472	.804	.918
Month	24	11.00	1.00	12.00	156.00	6.5000	.7198	3.5263	12.435	.000	.472	-1.216	.918
Valid N (listwise)	24												

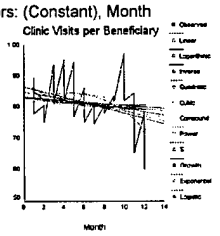
Y: 

X: 

7. Inferentials:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.316[a]	.100	.059	8.479E-02

a. Predictors: (Constant), Month



Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.749E-02	1	1.749E-02	2.433	.133[a]
	Residual	.158	22	7.190E-03		
	Total	.176	23			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.865	.037		23.428	.000
	Month	-7.82E-03	.005	-.316	-1.560	.133

a. Dependent Variable: Clinic Visits per Beneficiary

8. Accept the null hypothesis, Y <> f(X1) + f(X2) + . . . f(X12)
9. Alternate Method: Decomposition

The seasonal relatives are:

Season	Relative	Season	Relative
1	1.0511	2	0.8850
3	0.8200	4	1.0049
5	0.9463	6	1.0676
7	1.0914	8	1.0638
9	1.0095	10	0.9825
11	1.0131	12	1.0656

The trend equation is: Intercept = 0.897, Slope = -0.007

MSE = 0.00, MAD = 0.03, Bias = -0.00, Coefficient of variation = 1.18

10. Despite statistical insignificance under regression, decomposition does provide a fairly "tight" fit as illustrated previously.

Appendix E - After Action Report from JRTC Rotation

MCXV-RES (650) 13 Aug 97

MEMORANDUM FOR Commander, Bayne-Jones Army Community Hospital

SUBECT: After Action Report, 82d Airborne Division Airborne Operation

1. Purpose: To provide feedback regarding the medical support for the 82d Airborne Division's mass tactical jump of 12 August 1997.

2. Background: A brigade of the 82d Airborne Division conducted a mass tactical jump into the Joint Readiness Training Center at 203012August1997. Observations and recommendations from this jump are listed below.

3. General Observations and Recommendations:

a. No Standing Operating Procedure for real-time casualty evacuation:

(1) Problem: The casualty evacuation plan for JRTC was an amalgamation of 82d Airborne procedures, word of mouth arrangements, and misunderstandings.

(2) Recommendation: C, PTMS should staff a Standing Operating Procedure (SOP) through the installation and all appropriate agencies. Additionally, the chief should provide copies of this SOP to all units deploying to the box at the D-180 briefing. From this SOP, a working CHS plan should be developed by the unit in conjunction with C, PTMS.

b. Signal communication, both external and internal, was not standardized and not coordinated.

(1) Problem: Evacuation signals arranged between the 82d Airborne Division and the 36th Medical Detachment were inappropriate and not disseminated to the appropriate decision-makers. The 82d Airborne Division Medical Operations Center (DMOC) Evacuation Officer coordinated for white lights and white strobes to mark the location of casualties; however, the pilots of the 36th Medical Detachment were equipped for night vision goggles. After consultation, the pilots determined that rotating chemlites (secured to 550 cord) would effectively mark the injury sites. Some of the units internal to the 82d Airborne used this same signal for marking their assembly areas. Finally, red chemlites were reserved for real-life casualties based on the brigade's internal SOP; however, at least one red chemlite marked the spot of a lost weapon.

(2) Recommendation: The SOP mentioned in paragraph "a" could resolve this problem.

c. Aircraft were not prepositioned to support the troops:

(1) Problem: The 36th Medical Detachment internal SOP allows them to respond to jumps from the airfield. The pilot-in-command (PIC)

MCXV-RES (650)
SUBECT: After Action Report, 82d Airborne Division Airborne Operation

(2) indicated that the maximum time for a response would be eight minutes from the time the call was received until the time the aircraft arrived.

(2) Recommendation: Although eight minutes seems nominal, prepositioning the aircraft reinforces the concept of "support forward" espoused in health care doctrine. Change the JRTC RSOP to require on-site evacuation assets, weather permitting.

d. Ground evacuation was unable to be rehearsed due to Operations Group Policy.

(1) Problem: CPT Orlando of the Division Medical Operations Center attempted to rehearse real-life evacuation of casualties from the drop zone; however, Operations Group denied him access to the area.

(2) Recommendation: For safety reason, Operations Group must change its policy and allow medical rehearsals (both day and night) prior to any operation. These rehearsals should be conducted in conjunction with representatives from BJACH PTMS.

e. Internal response to casualty load.

(1) Problem: X-Ray technician did not call for additional help when casualties started arriving.

(2) Recommendation: C, PTMS should estimate casualties and coordinate with DCCS and DCA for requisite on-call or on-station staffing.

f. Closure of Troop Medical Clinic (TMC) Four.

(1) Problem: For the airborne operation, the 82d Airborne Division closed TMC Four to leverage its medical staff. This closure resulted in a patient backlog in BJACH the next morning as casualties awaited transfer back to the TMC and new injuries arrived at the hospital.

(2) Recommendation: Establish policy in the standing operating procedure which ensures operation of the TMC during the entire operation or which leverages the use of available echelon three assets.

g. Inadequate administrative support.

(1) Problem: Administrative staffing was not augmented during the operation which resulted in some three hour differences between arrival and entry into CHCS. The patients received treatment, but the documentation was slow.

(2) Recommendation: Activate the MASCAL plan for the next operation to ensure adequate staffing.

4. Specific comments from the 82d Airborne Division: All of the DMOC's observations are summarized in this AAR. The original Facsimile is on-file with C, PTMS.

MCXV-RES (650)
SUBECT: After Action Report, 82d Airborne Division Airborne Operation

5. POC: CPT Fulton, 3111.

LAWRENCE V. FULTON
CPT, MS
C, PTMS

Appendix F - Satisfaction Survey Errors

MCXV-RES 20 Dec 1997

MEMORANDUM FOR DCA, Fort Polk

SUBJECT: Errors in Satisfaction Survey Data Gathering and Analysis

3. **Purpose.** To illustrate errors in the data gathering and inferential statistics of the patient satisfaction survey.

2. **Background.** The four patient satisfaction surveys received by Bayne-Jones Army Community Hospital reportedly reflect the following survey periods: April-May, April-May-June, June-July-August, July-August September. The contractor provides the results of each survey and compares them to the previous one; however, combining dates for comparison may not be appropriate. By separating out individual months, a clearer picture of patient satisfaction is available. Specifically evaluating question five (overall medical care satisfaction), question 10b (overall access satisfaction) , and question 12 (overall clinic satisfaction) by month by clinic can provide insight into the survey itself. These specific variables, pre-defined in the survey, are the focus of this short study.

4. **Problem Statement.** The alternate hypotheses for this study are: overall clinic satisfaction, overall medical care satisfaction, and overall access satisfaction are functions of specific months and specific clinics. The null hypotheses suggest that there is no discernable relationship between these variables. The alpha limit for this study is .05. If the alternate hypotheses are accepted, then monthly trend graphs and analysis for the dependent variables are statistically supported. Specifically of interest to Bayne-Jones is the behavior of patient satisfaction during the months of July, August, and September. Patient satisfaction for the hospital should have dropped in July and August due to deployments and provider shortages; however, during the month of September satisfaction should have partially rebounded.

5. **Methodology.** Matching the methodology of the contractual survey, this researcher combined the four text files provided in the last four surveys and evaluated them for duplication of records. After importing the text file into the Statistical Package for the Social Sciences ®, the string data were coded into usable numerical equivalents and labels were applied. Specific sorts were conducted to evaluate time frames. In accordance with the methodology of the original survey, the data were weighted by the appropriate weight variable. Hierarchical analysis of variance was conducted and means and counts were evaluated. The results of the means and counts were sent to spreadsheets for mean plots and tabulation.

6. **Descriptive statistics.** Simple descriptive statistics and frequencies are provided in the next two tables. NOTE: *No surveys were collected in July*. This fact could reflect a contractor error.

Table 1: Descriptive statistics for the variables of interest.

Statistics

	N						Std.					Percentiles		
	Valid	Missing	Mean		Median	Mode	Deviation	Variance	Range	Minimum	Maximum	25.00	50.00	75.00
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Date	1241	0	2.20	3.39E-02	2.00	1	1.19	1.42	3	1	4	1.00	2.00	3.00
Clinic	1241	0	13.10	.17	15.00	19	5.96	35.53	20	1	21	8.00	15.00	19.00
Access Satisfactio	1114	127	3.78	3.91E-02	4.00	5	1.30	1.70	5	1	6	3.00	4.00	5.00
Medical Care Satisfactio	1203	38	5.75	4.56E-02	6.00	7	1.58	2.51	6	1	7	5.00	6.00	7.00
Clinic Satisfactio	1196	45	5.62	4.62E-02	6.00	6	1.60	2.56	6	1	7	5.00	6.00	7.00

MCXV-RES
SUBJECT: Errors in Satisfaction Survey Data Gathering and Analysis

Table 2: Frequency tables for the independent variables.

Date

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	May	521	42.0	42.0	42.0
	Jun	210	16.9	16.9	58.9
	Aug	250	20.1	20.1	79.0
	Sep	261	21.0	21.0	100.0
	Total	1241	100.0	100.0	
Total		1241	100.0		

Note 1: The contractor did not provide any surveys actually from July despite the packaging title.
Note 2: The numbers reflected in the descriptive statistics are weight-adjusted.

Clinic

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Internal medicine	98	7.9	7.9	7.9
	Nutrition care	5	.4	.4	8.3
	Dermatology	35	2.8	2.8	11.2
	General surgery	32	2.6	2.6	13.8
	Otorhinolaryngology	18	1.5	1.5	15.2
	Gynecology	41	3.3	3.3	18.6
	Obstetrics	41	3.3	3.3	21.9
	Pediatrics	43	3.5	3.5	25.4
	Orthopedics	37	3.0	3.0	28.3
	Cast	12	1.0	1.0	29.3
	Podiatry	15	1.2	1.2	30.6
	Troop medical clinic	78	6.3	6.3	36.8
	Optometry	38	3.0	3.0	39.9
	Community health	85	6.9	6.9	46.7
	Occupational health	78	6.3	6.3	53.0
	Emergency room	156	12.6	12.6	65.6
	Physical therapy	66	5.3	5.3	70.9
	Occupational therapy	26	2.1	2.1	73.0
	Family practice	265	21.4	21.4	94.3
	Audiology	66	5.3	5.3	99.6
	Medical exams	5	.4	.4	100.0
	Total	1241	100.0	100.0	
Total		1241	100.0		

6. **Inferential statistics.** The hierarchical analysis of variance for all three models requires rejection of the null hypotheses. Medical care satisfaction is a function of both month and clinic ($F=4.41$, $p=.000$, $R^2 = .098$). Access satisfaction is a function of both month and clinic ($F=5.58$, $p = .000$, $R^2 =.074$). Finally, clinic satisfaction is a function of both month and clinic ($F=5.41$, $p=.000$, $R^2=.088$). Analysis of Variance models are provided on the next page. With valid models, mean trends were then analyzed and plotted in Microsoft Excel. The graph immediately below illustrates the trends in satisfaction.

Figure 1: A quick graph by month illustrates the overall changes in patient satisfaction. Note the turnaround in September after some providers returned from deployment.

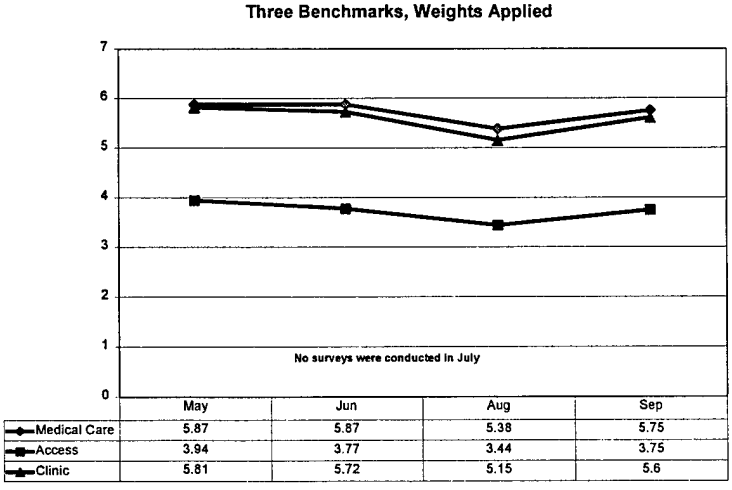


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Table 3: The ANOVA tables illustrate the significance of the models.

ANOVA[a]

			Hierarchical Method				
			Sum of Squares	df	Mean Square	F	Sig.
Medical Care Satisfaction	Main Effects	(Combined)	221.873	23	9.647	4.406	.000
		Date	42.745	3	14.248	6.507	.000
		Clinic	179.128	20	8.956	4.090	.000
	2-Way Interactions	Date * Clinic	318.217	50	6.364	2.907	.000
	Model		540.090	73	7.398	3.379	.000
	Residual		2472.685	1129	2.190		
	Total		3012.775	1202	2.506		

a. Medical Care Satisfaction by Date, Clinic

ANOVA[a]

			Hierarchical Method				
			Sum of Squares	df	Mean Square	F	Sig.
Access Satisfaction	Main Effects	(Combined)	185.251	23	8.054	5.580	.000
		Date	36.732	3	12.244	8.482	.000
		Clinic	148.519	20	7.426	5.144	.000
	2-Way Interactions	Date * Clinic	207.076	50	4.142	2.869	.000
	Model		392.327	73	5.374	3.723	.000
	Residual		1501.757	1040	1.443		
	Total		1894.083	1113	1.701		

a. Access Satisfaction by Date, Clinic

ANOVA[a]

			Hierarchical Method				
			Sum of Squares	df	Mean Square	F	Sig.
Clinic Satisfaction	Main Effects	(Combined)	268.982	23	11.695	5.414	.000
		Date	70.067	3	23.356	10.811	.000
		Clinic	198.916	20	9.946	4.604	.000
	2-Way Interactions	Date * Clinic	363.911	50	7.278	3.369	.000
	Model		632.894	73	8.670	4.013	.000
	Residual		2424.570	1122	2.160		
	Total		3057.464	1195	2.558		

a. Clinic Satisfaction by Date, Clinic

Although the ANOVA models indicate statistical significance, how has each clinic done in comparison to previous months? The tables on the next page illustrate by month changes in clinic performance. Note: most of the clinics have improved significantly since the hospital received backfill in September.

MCXV-RES
SUBJECT: Errors in Satisfaction Survey Data Gathering and Analysis

Table 4: The table below illustrates the true gains and losses in satisfaction by clinic by month. NOTE: statistical significance is not indicated by each clinic. Also, note that the trend is **positive** for all three dependent variables. Also note that the red numbers indicate a negative trend (whether statistically significant or not); however, most of these clinics still exceed the Military Health Services and Health Maintenance Organization benchmarks.

MEDICAL CARE SATISFACTION					ACCESS				CLINIC			
Clinic	**May**	**Jun**	**Aug**	**Sep**	**May**	**Jun**	**Aug**	**Sep**	**May**	**Jun**	**Aug**	**Sep**
Internal medicine	5.79	6.40	5.84	5.33	4.19	2.84	3.50	3.99	6.18	6.01	5.81	5.80
Nutrition care	7.00	5.84			3.11	3.84			7.00	5.84		
Dermatology	6.16	5.86	6.48	6.32	4.12	4.26	3.59	4.04	6.35	5.79	6.18	6.31
General surgery	6.37	5.65	6.26	5.22	4.28	4.30	3.63	3.68	6.51	5.76	6.01	5.43
Otorhinolaryngology	5.37	6.58			4.44	4.01			5.81	6.75		
Gynecology	6.49	5.80	5.69	5.63	3.84	3.32	3.43	2.98	6.55	5.55	5.93	5.74
Obstetrics	5.81	6.33	5.82	5.00	3.81	3.56	3.76	4.00	5.49	5.89	5.82	4.33
Pediatrics	6.25	6.75	5.71	5.85	4.20	4.38	3.59	4.05	5.95	6.50	5.90	6.37
Orthopedics	5.37	5.67	5.86	5.56	3.23	3.53	3.67	3.45	5.34	5.79	5.69	5.68
Cast	5.16	5.16			3.63	3.24			5.64	5.16		
Podiatry	6.09	6.00			3.48	3.79			6.21	6.11		
Troop medical clinic	6.09	4.16	6.00	5.18	3.72	4.42	4.00	2.72	4.80	4.16	6.00	5.18
Optometry	6.85	6.40	6.17	6.63	3.07	3.74	3.56	4.24	6.62	6.15	5.72	6.54
Community health	5.29	3.27	4.95	7.00	4.73	2.89	3.46	5.00	5.66	3.27	4.44	7.00
Occupational health	5.00	6.40	5.74	5.87	3.11	4.26	4.64	4.08	5.24	6.24	5.74	5.87
Emergency room	5.98	6.78	5.10	6.14	3.97	4.89	3.23	4.35	5.10	6.78	5.28	6.14
Physical therapy	6.62	6.74	6.42	6.31	4.85	3.74	3.84	4.65	6.46	6.08	5.81	6.57
Occupational therap	6.19	5.38	6.49	5.73	5.07	4.36	4.38	4.10	6.53	5.64	6.57	5.68
Family practice	5.71	6.01	4.35	5.69	3.63	3.27	2.71	3.38	5.89	5.76	4.02	5.03
Audiology	6.00	6.11	5.85	5.12	3.70	3.60	5.00	2.89	5.79	5.95	4.96	4.91
Medical exams			3.00	3.96			3.00	3.14			3.00	5.03
Total	5.87	5.87	5.38	**5.75**	3.94	3.77	3.44	**3.75**	5.81	5.72	5.15	**5.60**

7. **Recommendations and Conclusion.** This short study illustrates a problem with data collection and evaluation. *Because the contractor lumps surveys from different dates into each analysis, evaluation of data over time is impossible without returning to the original data files.* By separating out the data monthly, a clearer and more useful picture emerges. Specifically, Bayne-Jones Army Community Hospital data reflected negative trends when, in fact, the trends are generally positive. In addition, no data were collected for the month of July. This automatically induces error into any trending. One final comment: over time, the data must be analyzed for seasonality using decomposition or other methods. The seasonality component of satisfaction is likely related to provider access during times of increase use or provider decrements, e.g., the summer influx, flu season, etc.

8. **Point of contact.** The undersigned at DSN 863-3111.

LAWRENCE V. FULTON
CPT, MS
Administrative Resident

Appendix G - SWOT Analysis

Strengths	**Weaknesses**

+ Work force
  + Work ethic
  + Competent
  + Experienced
+ Third party program
  + Flexibility
  + Ownership
+ Unused clinical capacity
+ Unused enrollment capacity
+ Good product
+ Defined population
+ Capacity for care
+ Improved ability to access complex data bases
+ 9. CHCS access
	+ Limited facilities
	+ General knowledge of "the business of medicine"
	+ No shared vision among administrative and clinical staff
	+ Little information flow downward
	+ Temporal instability
	+ Failure of TRICARE implementation /customer buy-in
	+ Workload capture
	+ Failure to advertise strengths to staff and patients
	+ No focus/ priority on information planning
	+ 9. Limited information sharing

Opportunities	**Threats**
+ Customer perceptions of access to care + Prime enrollment + Prime vendor + Empowerment of employees/soldiers + Loyal customer base + Relationship with JRTC/115th Field hospital + Clinical pathways + Ft Polk family support groups + Foundation health assets + MEDCOM / Army support + Current corporate culture + Improved utilization management + Consolidated primary care + OB / well baby care + Community health /home care + Customer service training for employees + Increased recognition of limited MTF assets	+ Budget procedures/changing rules + Unknown customer expectations + Personnel inflexibility/ cumbersome regulatory restrictions + High overhead/ personnel costs + Inaccurate workload capture + Marketing expertise + Perception of military health care + No advertising budget/ Limited "free" media coverage + Integrating complex information systems + Doing more with less

Appendix H - Mission Statements of Medical Command and Great Plains Regional Medical Command

MEDCOM Mission

Provide medical readiness for the U.S. Army by projecting a healthy and protected force; deploying the medical force; and managing the care of the soldier, the soldier's family, and the extended Army family.

GPRMC Mission

The mission of the GPRMC is to provide regional command and control of a cost effective, multidisciplinary, customer-focused, quality integrated health service system that supports the DOD Lead Agent concept. This region is accountable to develop and sustain technical health care and leaders skills in support of USMEDCOM and maintenance of a readiness posture in support of America's Army. The GPRMC is responsible for analyzing requirements, allocating resources, and assessing performance across the region.

BJACH Mission

WE PROVIDE THE BEST total quality care to our military men and women, their families, and military retirees and their families. We ensure timely access and delivery of patient-oriented healthcare while simultaneously optimizing support to the Joint Readiness Training Center (JRTC) mission and maintaining our readiness to support the missions of the United States Army.

The missions of United States Army Medical Command, Great Plains Regional Medical Command, and Bayne-Jones Army Community Hospital link together as depicted by the colored text and arrows.

Appendix I - Decision Briefing for Integration of TMC into Facility

Facts and Assumptions

- Plan calls for increase in patients at B Company (app. 4000)
- Plan calls for changes in hours of operation
- Cost is a function of capabilities desired
- Satisfaction is a function of capabilities available
- The hospital requires personnel "bill payers" to execute the health promotion mission

Facts and Assumptions

- **Pharmacy options and costs**
  - **Courier: $0K, with potential savings of RX tech**
  - **Yugo: $70K annually (requires pharmacist)**
  - **Saturn: $120K annually (pharmacist and 2 techs)**
  - **Cadillac: $160K ($40K construction to hold narcotics-JSIIDS, Bars, etc.)**
  - **Integration: $50K, with potential savings of RX tech, equipment resale, etc.**

Facts and Assumptions

- **Laboratory options and costs**
  - **Courier: $0K**
  - **Yugo: $25K (hematology only)**
  - **Saturn: $35K (chemistry only)**
  - **Cadillac: $120K (both + civilian FTE)**
  - **Integration: $0K, with potential savings from equipment sales and personnel requirements**

Facts and Assumptions

- **XRAY options and costs**
  - **Courier: $0K**
  - **Yugo: $5K (move extra mil tech, papoose board and pigg-o-stat)**
  - **Saturn: $75K (extra xray room)**
  - **Cadillac: $150K (extra clerk and extra room)**
  - **Integration: $0K, with potential savings from equipment sales**

Facts and Assumptions

- **Pediatric options and costs**
  - **None: $0K**
  - **Yugo: $10K basic scales, equipment, supplies, childproofing, no complicated cases/newborns**
  - **Saturn: $20K crash cart, ancillary support, etc., more complicated cases/newborns**
  - **Cadillac: $30K increased capability, full service**
  - **Integration: $0K**

Facts and Assumptions

- **OB options and costs:**
  - **None: $0K**
  - **Yugo: $15K, VAS, Flex Sig, Colpo room with colposcopies**
  - **Saturn: $25K, ultrasound**
  - **Cadillac: $50 + fetal stress monitors**
  - **Integration: $0K**

Facts and Assumptions

- Space is a factor
  - Medical records holding at TMC
  - Parking at TMC
  - OB record transport to TMC
  - Sufficient space for TMC operations in hospital facility

Facts and Assumptions

- Consolidation of Mental Health Assets will improve continuity of care
- Economies of Scope (shared resources) can be accomplished by consolidation efforts

Facts and Assumptions

- Realignment is possible
  - TMC (including avn med) can fit comfortably into 2d floor if
    - DOM moves to 7th floor
    - Derm and Cardiopulmonary moves to 5th floor
    - SWS/Psych/ADAPCP move to TMC (Mental Health Clinic)
    - OTD moves to SWS area
- Realignment has associated costs
  - Costs for optimization of business offices, switching phones, etc. will total $50K
  - Costs for moving DOM will total $50K

Facts and Assumptions

- Cost is a driving factor
- Time is a driving factor
- Location is a driving factor
- Personnel disruption is a driving factor
- Capability is a driving factor
- Satisfaction is a driving factor
- Space is a driving factor
- Economies of scope are desirable

COA 1: Courier

- Courier model: courier service only, existing assets perform patient care
  - elimination of RX to avoid litigation
  - no expansion of civilian hours of operation
  - OB without expansion of ultrasound and fetal external monitors
  - peds, limited blood draws and no xray expansion

COA 2: Yugo

- Yugo model: courier service plus
  - RX (pharmacist) minus narcotics
  - minimal lab (hematology)
  - peds x-ray equipment
  - OB without expansion of ultrasound and fetal external monitors
  - peds, limited blood draw

COA 3: Saturn

- Courier service plus:
  - pharmacist and extra tech
  - chemistry only
  - extra xray room
  - OB
  - peds

COA 4: Cadillac

Full service outpatient clinic

COA 5: Integration

- **Move TMC into 2d floor**
- **Move DOM to 5th and 7th floors**
- **Move SWS/DOP/ADAPCP to TMC**
- **Move OTD to SWS**

Cursory Financial Analysis

	Est one-time $ in 000	Est annual $ in 000	Total 1st Year	Total 2d Year
ourier	$0	$0	$0	$0
ugo	($5)	($70)	($75)	($146.40)
aturn	($100)	($120)	($220)	($342.40)
adillac	($150)	($205)	($355)	($564.10)
ntegration	($50)	$240	$190	$434.80

Criteria

- **Cost (two years)**
- **Time (time to execution)**
- **Location (proximity to troops)**
- **Personnel disruption (amount of movement)**
- **Capability (number of services)**
- **Satisfaction (perception by patients)**
- **Space (parking, facilities, records)**
- **Economies of scope (shared assets)**

Analysis + Comparison

Unweighted model — *Lower is Better*

	Cost	Time	Location	Disruption	Capability	Satisfaction	Space	Economies of scope	Total
Courier	2	1	2.5	1	5	5	3.5	3.5	23.5
Yugo	3	2	2.5	2	4	4	3.5	3.5	24.5
Saturn	4	4	2.5	3	3	3	3.5	3.5	26.5
Cadillac	5	5	2.5	4	2	2	3.5	3.5	27.5
Integration	1	3	5	5	1	1	1	1	18

Other Factors

- Family practitioners inpatient responsibilities
- Shortage of providers during summer
- Identification of "hospital" as quality
- Perception of inequity

Recommendation

COA 5: Integration

Appendix J - Plan for Improving Health Care at BJACH

OPERATION PLAN FOR IMPROVING HEALTH CARE AT BJACH (OPLAN 05-01-98)

References: Maps of BJACH, attached

Time Zone Used Throughout the Order: LOCAL

Task Organization: See Annex A

1. Situation:

a. Enemy Forces: See Annex B

b. Friendly Forces: No change

c. Attachments: Effective 16 Jun 1998, the United States Army Air Ambulance Detachment is attached to USAMEDDAC, Fort Polk.

2. Mission: BJACH identifies the health care needs of its beneficiaries and tailors available services to meet those needs in the areas of health care delivery, health promotion and disease prevention NLT 010700JUN1998.

3. Execution

a. Concept of the Operation: BJACH realigns itself to focus on health care promotion and wellness by:

(1) Adapting the Wellness and Readiness Center organizational structure depicted at Annex A

(2) Establishing the Wellness and Readiness Center at the old Chesser Dental Clinic (Annex C)

(3) Aligning primary care providers into functional teams based upon units (Annex D)

(4) Aligning health promotion assets with the functional teams (Annex A)

(5) Integrating other Fort Polk unit providers into their appropriate teams (Annex E)

(6) Integrating the TMC into DFP (Annex F)

(7) Establishing the Behavioral Services Directorate at the TMC (Annex G)

(8) Focusing on the TRICARE Prime population by reducing Space A so that we can meet the access standards. (Annex H)

(9) Adopting the financial plan at Annex I

(10) Adopting the marketing plan at Annex J

(11) Adopting the primary care provider practice plan at Annex K

(12) Adopting the operations plan at Annex L

(13) Adopting the administrative rating scheme at Annex M

(14) Adopting the empanelment plan at Annex N

My intent is to provide an effective method for managing the health and wellness of the population at Fort Polk, while reducing costs, increasing access for TRICARE Prime, and improving quality.

b. Tasks to Subordinates:

(1) Action Officer: Has primary responsibility for ensuring the execution of all plans.

(2) DCCS: Has primary responsibility for execution of clinical reorganization (less nursing)

(3) DCA: Has primary responsibility for execution of all administrative reorganization

(4) DON: Has primary responsibility for execution of all nursing reorganization

c. Coordinating Instructions.

(1) Changes to this plan will NOT be official unless provided in writing.

(2) Coordination with AO encouraged (531-3111).

4. SERVICE SUPPORT: No change.

5. COMMAND AND SIGNAL:

a. Command. Changed as indicated in Annex A

b. Signal. Sample tracking logs and Gannt charts attached at Annex Q.

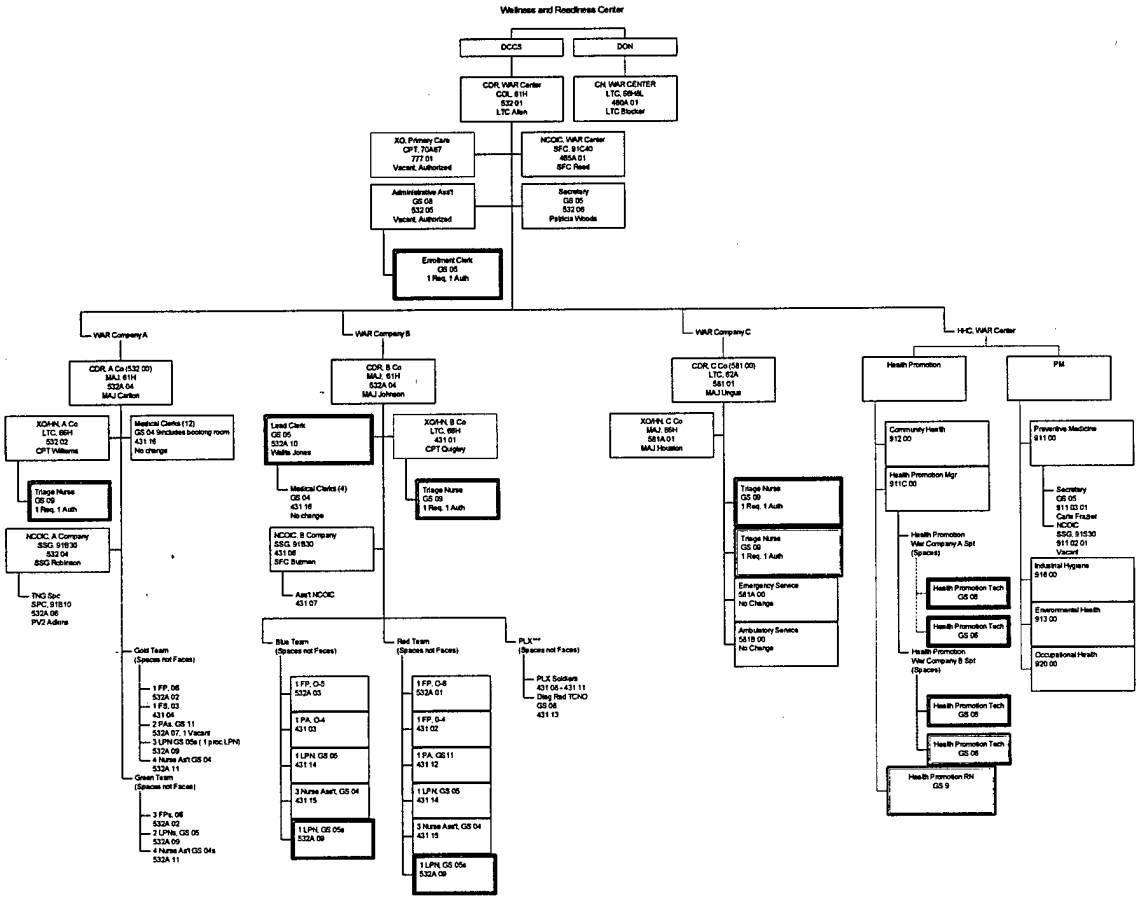
6. SAFETY. Safety Division conducts full analysis of all moves, etc.

ACKNOWLEDGE: Ack receipt to AO at 531-3111.

FOX
COL

ANNEX A-Task Organization
ANNEX B-Enemy Forces
ANNEX C-WAR Center
ANNEX D-Primary Care Teams
ANNEX E-MOA with other units
ANNEX F-Integration of TMC
ANNEX G-Behavioral Services
ANNEX H-Focus on TRICARE Prime
ANNEX I-Financial Plan
ANNEX J-Marketing Plan
ANNEX K-Provider Practice Plan
ANNEX L-Operations Plan
ANNEX M-Administrative Rating Scheme
ANNEX N-Empanelment Plan
ANNEX O-Union Employees Affected
ANNEX P-Metrics
ANNEX Q-Tracking Logs

ANNEX A: Task Organization



Mission: NLT 1 June 1998, BJACH adopts the organizational structure depicted above to support the organization's mission and vision.

Execution:

a. Concept of the Operation. This operation occurs in four phases. Phase one (1 June 1998) is the establishment of green team and closure of the acute minor illness (walk-in clinic). Phase two (15 June 1998) is the establishment of gold team. Phase three is the establishment of blue and red teams (15 July 1998) after the consolidation plan is implemented. Phase four is the coordination of the MOA between this organization and other Fort Polk organizations for sharing medical assets.

b. DFP: Ensures the establishment of the teams by E-Date IAW the contents of this plan.

c. PAO: Markets according to Annex J.

ANNEX B-Enemy Forces

+ Enrollment-Based Capitation
+ Defensive Medicine
+ Loss of providers
+ Loss of ancillary staff
+ Loss of workload
+ Increased OPTEMPO
+ DACOWITS report
+ No continuity of care
+ Mental health fragmentation
+ Budget cuts
+ Projected budget cuts

ANNEX C-Establishment of the Wellness and Readiness Center at Building 1561

Mission: Preventive Medicine and HQ, Department of Family Practice combine to form the Wellness and Readiness Center and relocate to Building 1561 NLT 8 Aug 1998.

Execution:

a. Concept of the Operation: Building 1561 is modified IAW the attached diagram to support the Headquarters, Wellness and Readiness Center.

b. FMED:

(1) Responsible for necessary construction identified by WAR Center team and AO (CPT Lees)

(2) Provides trucks (on order) to support move

(3) Provides telephone switch changes as necessary

c. PM:

(1) Conducts site analysis and evaluation to plan move

(2) Coordinates with FMED for telephone and truck support

(3) Coordinates with Automation for support

(4) Coordinates with PAO for press release

(5) Establishes order of movement

(6) Coordinates with Logistics (Medical Maintenance) for moving hearing booth and other medical maintenance items

(7) Identifies and orders supplies as required

d. Logistics:

(1) Provides TI support and advice for moving medical equipment

(2) Provides moving truck and driver to support move

e. DFP: Prepares press release and submits to PAO one month prior to opening

f. PAO: Edits and submits press release

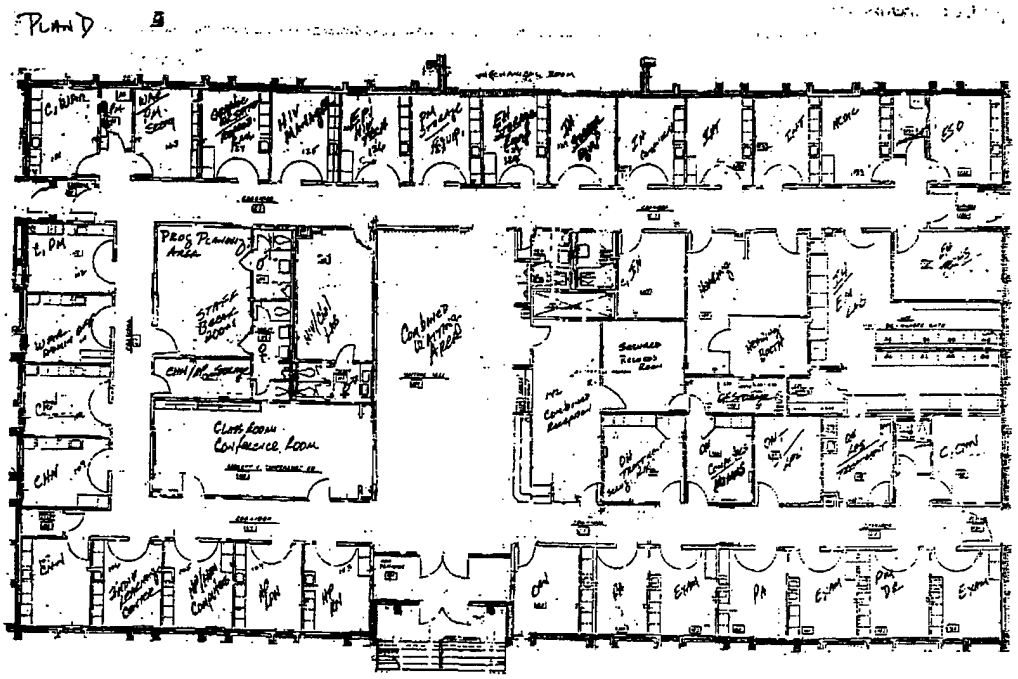
g. Medical company: On order, provides three-man detail for assistance

h. RMD: Provides appropriate union notifications

i. Coordinating instructions.

(1) Move will be conducted on Friday, Saturday, Sunday and Monday to minimize interference with patient care

(2) Move will not involve overtime of civilian employees unless necessary to accomplish the mission.



ANNEX D-Alignment of Providers with Units

Green Team

Position	*Staff*	*Units*
Dr.	CPT Clay	4/2 ACR
Dr.	CPT Latzka	2/2 ACR
Dr.	CPT Weeks	RSS
LPN	Weiner	87th CHEM
LPN	Hemingway	84th EN
NA	Thomas	159th AVN
NA	Onuschek	MEDDAC
NA	Mayhue	DENTAC
NA	Martin	CID
Clerk	Prevatt	
Clerk	White	
Clerk	Vacant	

Gold Team

Position	*Staff*	*Units*
Dr.	MAJ Carlton	1/2 ACR
Dr.	CPT Pockrandt	3/2 ACR
Dr.	CPT Lovins	502 MI
Dr.	Livonia	ADA Batt
PA	Jefferson	HHT
LPN	Firesheets	36th Med
LPN	Barlow	USAF Det 1
NA	Adkins	548 CTS
NA	Herring	USAF 21st ASOS
NA	Harris	USAG Flt Det
NA	Baggett	NCO Academy
Clerk	Gardner	
Clerk	Gray	
Clerk	Roberson	

Red Team

Position	*Staff*	*Units*
Dr.	MAJ Johnson	JRTC Ops
Dr.	MAJ Frye	JRTC HQ
Dr.	CPT Gaston	HHC USAG
LPN	Harmason	1/509th
LPN	Reed	51st Chem
LPN	Hardy	2d Bde
NA	Brodeur	75th Div (EX) 56 NG
NA	Perez	1275th Log Sup Bn (NG)
NA	Ortiz (M)	
Clerk	Eccles	
Clerk	Hale	
Clerk	Brown	

Blue Team

Position	*Staff*	*Units*
Dr.	LTC Allen	Warrior BDE
Dr.	CPT Livinston	5th PSC
Dr.	CPT Brunetti	46th EN
Dr.	Hamm	485th Med
LPN	Graves	565th Med
LPN	Dartez	546th Maint
NA	Boswell	A Co USAG(MP)
NA	Twigg	519th MP
NA	Ortiz	115th FH
NA	Williams	45th EOD
Clerk	Knight	603d Trans
Clerk	Williams	HHD, 142d Spt Bn
Clerk	Butts	585th Trans
		814th En
		126th Fin
		11th PA
		126th CS
		95th CS
		229th Qm

ANNEX E - Proposed MOA between MSCs and USAMEDDAC

MEMORANDUM OF AGREEMENT
BETWEEN
THE 2D ARMORED CAVALRY REGIMENT,
FORT POLK, LOUISIANA
AND
BAYNE-JONES ARMY COMMUNITY HOSPITAL,
FORT POLK, LOUISIANA

1. **PURPOSE:** Provide guidance and designate responsibility for the support of Wellness and Readiness Company A, which provides timely health care for soldiers and family members of the 2d Armored Cavalry Regiment.

2. **REFERENCE:**

a. AR 40-4, U.S. Army medical Department Facility and Activity

b. AR 40-3, Medical, Dental, and Veterinary Care

c. MEDCOM Pam 40-5, Ambulatory Primary Care

3. **BACKGROUND:**

a. Wellness and Readiness (WAR) Company A is the primary care treatment unit designated to treat soldiers and family members of the 2d Armored Cavalry Regiment. Located in the hospital, it provides full service outpatient capability.

b. Health promotion and disease prevention are an integral part of clinic operations, facilitated by trained advice nurses and by use of health information handouts, classes, and other proactive methods of health management.

4. **UNDERSTANDING, AGREEMENTS, SUPPORT, AND RESOURCE REQUIREMENTS:**

a. Commander, Bayne-Jones Army Community Hospital shall:

(1) Provide accessible, full-service, family practice-based medical care for soldiers and family members of the 2d Armored Cavalry Regiment. These services include care for acute illnesses, routine and periodic examinations (i.e., well-baby care), gynecology services, prenatal care, and orthopedic services. Health promotion and disease prevention are integral parts of the services plan. The company will be staffed to ensure successful deliver of these services. Staffing goals include:

PRIMARY CARE	**PERSONNEL**	**GS/MOS**
Providers		
OIC (Family Physician)	1	61H
Team Leaders (Family Physician)	2	
Family Practice Physicians	4	61H
Other services available in-house		
Administrative		
Health Systems Administrator	1	GS 08
Medical Clerks	6	GS 04
Nursing		
Head Nurse	1	66H

Triage Nurse	1	GS 09
Health Promotion Tech	2	GS 06
Licensed Practical Nurse	4	GS 05
Nursing Assistants	8	GS 04
NCOIC	1	91C
Total Primary Care Staff	**31**	

(2) Provide consultation services for primary care medical problems to organic regimental assets, (e.g., soldier referral from sick call for further evaluation and treatment), including the aviation soldiers.

(3) Provide physical therapy services sufficient to active duty demand.

(4) Provide optometry support.

(5) Provide laboratory, pharmacy, and radiology services sufficient to mission demands.

(6) Provide telephone advice and access to same-day appointments.

(7) Provide MOS-specific training to soldiers working in the clinic on 12-week cycles. A minimum of three hours per week of formal documented Army medic training will be offered. The training will include those skills required for the soldier's performance of garrison, field, and combat tasks. Training activities will be coordinated between BJACH and the Regimental Surgeon.

(8) Ensure his/her representative serves as custodian of health records which will be processed, filed, and maintained at activities designated by the Installation Commander with the concurrence of the Director of Health Services (DHS).

(9) Be the release authority for all medical information from health records.

b. Commander, 2d Armored Cavalry Regiment shall:

(1) Ensure that each squadron commander provides three medics (91 B) for duty at WAR Company A for 12 consecutive week cycles on a recurring, continuous, and uninterrupted basis.

(2) Ensure the Regimental Surgeon coordinates the health care providers for the time periods or productivity indicated on normal clinic days (Monday through Friday, 0630-2030, except federal holidays):

(a) One health care provider (PA or physician) to serve as Medical Officer of the Day. The MOD will triage, evaluate and treat soldiers and family members after sick call hours (0630-0830).

(b) Two health care providers per clinic day to provide healthcare to the soldiers and family members of the 2d ACR from 0630 - 1100.

(3) Ensure all assigned and attached personnel participate in BJACH's ongoing Performance Improvement (PI) Program, including skills maintenance, completion of periodic training, and data collection for the PI Program.

5. **COORDINATING INSTRUCTIONS:**

a. Personnel designated for duty will be attached by memorandum from the supporting unit for special duty to the WAR Company for the full period of duty. The soldier's unit of assignment will retain authority for billeting and Uniform Code of Military Justice.

b. Leaves or passes will be minimized during the period of attachment. All leaves and passes will be coordinated through the WAR Company NCOIC.

c. Unit commanders may withdraw soldiers without advanced notice for the following:

(1) Emergency Deployment Readiness Exercises (EDRE).

(2) Real world contingency operations.

d. Soldiers attached to the WAR Company for special duty will be available on a continuous and uninterrupted basis. Soldiers will not be withdrawn for ceremonies, review, or other unforeseen taskings not related to EDRE or real-world contingency operations. The 2d ACR commits to ensuring the provision of high quality health care to its soldiers and family members as an integral condition of the Regiment's success.

e. Soldiers attached to the WAR Company for a 12-week tour of duty will be monitored by the WAR Company NCOIC for compliance with the Regimental-specific readiness requirements.

f. Soldiers in MOS 91B, regardless of grade, must pass a pretest for Algorithm Directed Troop Medical Care NLT ten days prior to the start of the support cycle. Contact the NCOIC, WAR Company A, 531-3519, to schedule evaluation and training.

g. The duty day at the WAR Company will be approximately ten hours. Shifts will be scheduled to maximize effective use of personnel to cover the entire daily operations. About 50% of personnel are off on training holidays.

h. Specific names and dates of health care providers for family member care should be provided to the WAR Company Commander NLT two weeks in advance of their duty day to allow appropriate patient scheduling. The clinic will schedule routine and same day appointments for these providers. The Regimental Surgeon is responsible for replacing providers who cannot attend their clinics except as in 5c above. The priority of commitment fo health care providers remains to the unit commander and unit missions.

i. Emergency medical services and ambulance coverage will be provided by BJACH, 24 hours per day.

j. Supervision. The Commander, BJACH and/or his designated representative shall exercise technical supervision over all health care services provided by the WAR Company.

k. Medical Workload. All medical workload performed at the WAR Company will be incorporated into the BJACH workload reports, to include funding for operating supplies, pharmaceuticals, and training of TDA personnel incurred because of this workload.

l. The BJACH Commander will provide the opportunity for on-post professional and technical proficiency training for AMEDD Officers assigned to MTOE units within available resources.

6. EFFECTIVE DATE, TERMINATION, MODIFICATION OR REVISION:

A. This agreement becomes effective upon signature of both parties.

b. This agreement will be reviewed annually, and may be revised at any time by mutual written consent of both parties.

c. This agreement shall remain in effect until superseded or rescinded by mutual consent. Either party may terminate this agreement by giving the other party 90-days written notice prior to the proposed termination date.

d. This agreement supersedes all previous MOAs which exist regarding this subject.

7. **APPROVAL:**

BAYNE-JONES ARMY COMMUNITY HOSPITAL

BY:
C. W. FOX,
TITLE: Colonel, Medical Corps
Commanding

DATE: _____

2D ARMORED CAVALRY REGIMENT

BY:

DATE: _____

ANNEX F-Integration of TMC into DFP

Task Organization: Two planning team task forces formed from leaders at IPRs

Mission: NLT 15 Jul 98, BJACH realigns its organization to provide all mental health care at the current Troop Medical Clinic and all primary care at the hospital to support quality, cost-effective health care and wellness initiatives and the ability to support red and blue teams.

Execution:

a. Concept of the Operation (See attached sketches). The realignment will occur in two phases. Phase one will involve the movement of the SWS into the TMC, the movement of OTD to SWS, the movement of 1/2 DOM to OTD, the movement of TMC to 1/2 DOM. Anticipated dates for phase one are 19 - 22 June 1998. Phase two will involve the movement of DOP to the TMC, the movement of ADAPCP to TMC, the movement of 1/2 DOM to 7th and 5th floors. Anticipated dates for phase two are 26 - 29 June 1998. My intent is to establish a Behavioral Health Directorate at the TMC and incorporate all health care teams into BJACH to provide better quality care more effectively

b. Planning Team 1:

(1) Identifies all of the requirements for phase I, including automation, vehicles, telephones, etc.

(2) Coordinates these requirements with Planning Team 2

c. Planning Team 2:

(1) Identifies all of the requirements for phase 2, including automation, vehicles, telephones, etc.

(2) Coordinates these requirements with Planning Team 1

d. FMED:

(1) Provides minor construction support as determined necessary.

(2) Provides transportation support as determined necessary

(3) Provides other support as necessary

e. Logistics Division:

(1) Evaluates all medical maintenance equipment to be moved for issues and works with appropriate sections to resove these issues

(2) Evaluates the feasibility of turning in medical equipment at TMC for credit

(3) Evaluates the medical maintenance issues in moving DOM and TMC

(4) Ensures hand receipts are changed appropriately

(5) Evaluates plan for potential logistics savings

f. PAO:

(1) Notifies the Guardian about the projected move dates after approved by the union

(2) Coordinates briefing times for commander to brief Major Subordinate Commanders affected by these actions

g. RMD:

(1) Processes appropriate union notifications

(2) Evaluates procedure for potential personnel savings

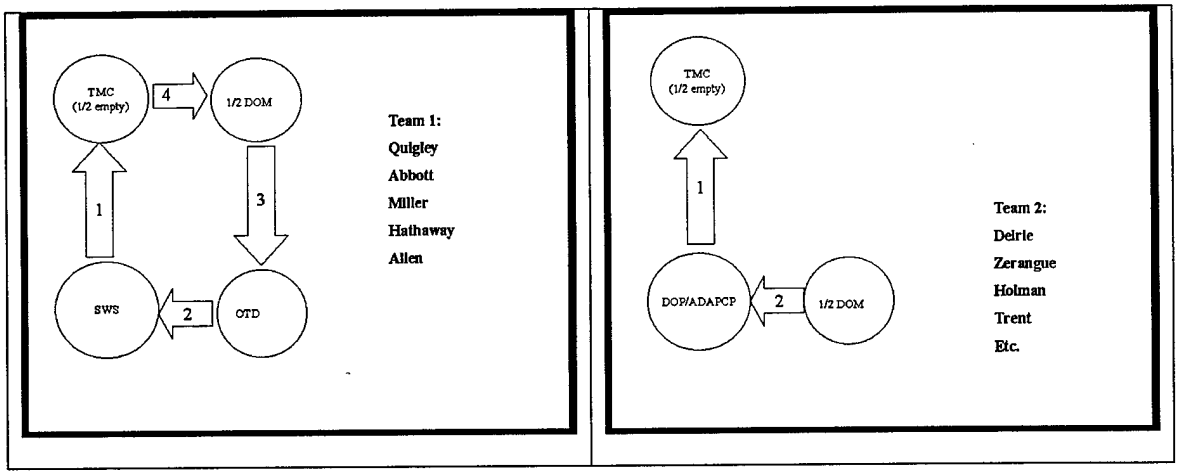
h. Coordinating instructions:

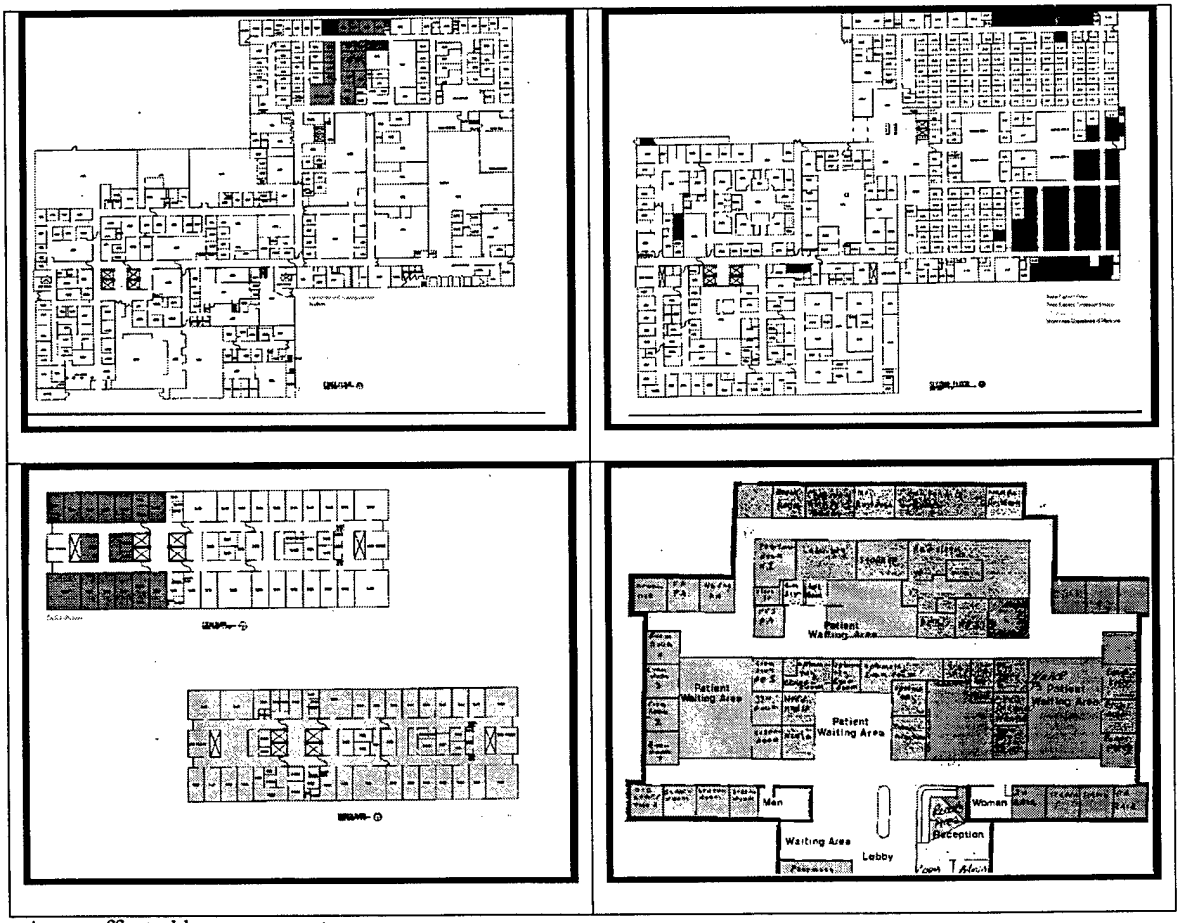
(1) This move is a hospital-wide effort and must be coordinated with every element of the facility upon approval by the unit.

(2) All elements will provide information to AO, 531-3111.

(3) Furniture will remain in place unless specific requirements exist. These requirements must be approved by an action officer.

ANNEX F-Integration of TMC into DFP





Areas affected by movement.

ANNEX G-Establishing the Community Mental Health Clinic

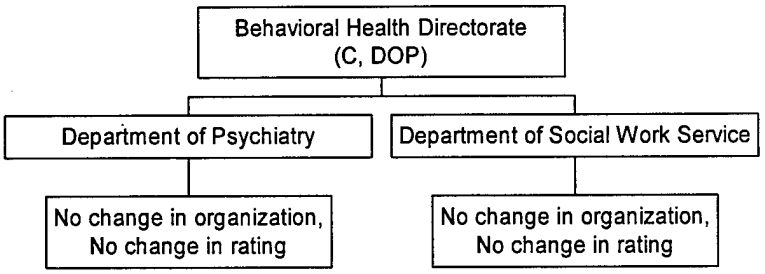
Mission: BJACH establishes the Behavioral Health Directorate at the current TMC location NLT 15 July 1998.

Execution:

a. Concept of the Operation. The CMHC is established to provide continuity of care for all mental health services at Fort Polk. Only supervisor rating schemes will be affected. My intent is to improve the coordination of mental health care services on Fort Polk.

b. RM: Coordinates the attached organizational structure with the union.

c. Coordinating Instructions: N/A



ANNEX H- Focusing on TRICARE PRIME

Mission. On 1 June 1998, USAMEDDAC Ft Polk maximizes access to TRICARE Prime patients in order to improve their health status, to increase Prime enrollment, and to ensure healthcare is provided in the appropriate setting at the right time.

Execution.

a. Commander's Intent. I intend to improve our customer / patient focus and to increase access to the healthcare services we provide for our TRICARE Prime beneficiaries. These healthcare services will focus on health promotion, prevention, and wellness rather than intervention. In addition, I intend to ensure that our Prime enrollees receive the right care, at the right time, and in the right setting. The overall goal for this operation is to improve the health status and satisfaction level of our Prime beneficiaries while simultaneously giving non-enrollees an incentive to enroll.

b. Concept of Support. Operation Prime includes modifying business practices and infrastructure to make Space Available TRULY Space Available care. To do this, Space A appointments will not be offered until 1230 every day and will only focus on appointments canceled by TRICARE Prime patients. The acute minor illness clinic will be closed.

c. Department of Family Practice and Department of Medicine

1. Cease operation of the Acute Care Clinic on 15 June 1998.

2. Appoint only beneficiaries enrolled in TRICARE Prime, Prime equivalents, and those patients who must be followed by their current PCM, as determined by the PCM and approved by the DCCS.

3. Distribute PCM team brochure and stickers to Prime beneficiaries.

4. ICW PMS, execute the comprehensive age-specific health, wellness, and prevention plans for the Department's beneficiaries.

5. Extend clinic hours if necessary to accommodate the needs of the PCM Team's panel.

ANNEX I-Financial Plan

Mission: BJACH provides financial incentives for WAR Company commanders to compete NLT 1 Oct 1998.

Execution:

a. Concept of the Operation:

Budgeting WAR Companies through Capitation

Each of the independent WAR Companies will receive an amount of money for the population serviced. This money will cover both fixed and variable costs less referral charges. The budget (B) for each clinic will be based upon the total population (N) which is both enrolled in TRICARE Prime and assigned to the clinic multiplied by a set capitated rate (CR); $B = N * CR$.

Incentives for the Primary Care Clinics

Each quarter, dollars saved from a clinic will be used for discretionary spending by the chief of the individual clinic. Clinic chiefs incapable of meeting budget may be subject to removal or relief.

b. RM: Evaluates and determines the appropriate capitated rate for each primary care company.

c. Coordinating instructions: changes to the capitated rate will be evaluated every quarter during the R&A.

ANNEX J-Marketing Plan

Mission: BJACH markets the Wellness and Readiness Center to ensure its success NLT 1 May 1998.

Execution:

a. Concept of the Operation. Marketing will occur in two phases: pre-execution and continuation phases. In both phases, all media needs to reflect the goal of BJACH to improve access for TRICARE Prime patients, improve quality, and decrease cost. My intent is for the community to understand our desire to provide the best.

b. PAO:

(1) PAO prepares brochures, marketing materials, television announcements, briefings, and other supporting media to inform the community about our pending realignments in phase one.

(2) Coordinates with FSGs, MSCs, Retirees, and other populations for town hall meetings.

(3) Continues updating brochures and marketing our efforts for realignment in phase two.

(4) Provides continuous feedback to ensure that the internal/external communication link is open.

c. Alpha and Bravo Company Commanders:

(1) Market their panels monthly during Newcomer's Orientation

(2) Develop a Steering Committee for their assigned units to provide

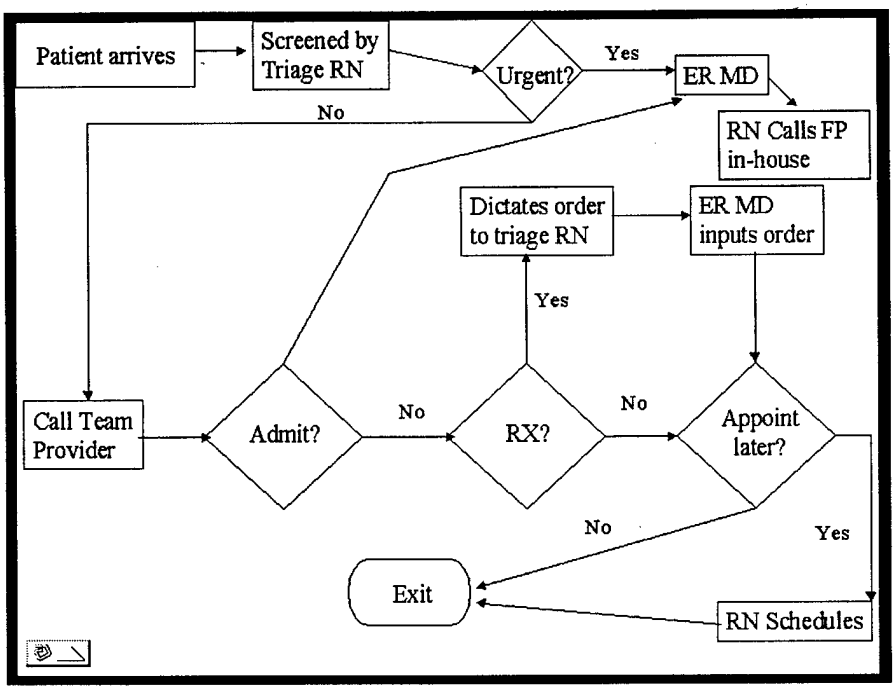
c. Coordinating Instructions: The Tracking Chart provides the marketing time-line information.

ANNEX K-Provider Practice Plan

Mission: The WAR Center changes scheduling templates to support its patient population NLT 1 Jun 1998.

Execution:

a. Concept of the Operation: Providers' schedules are managed by the administrative assistants and clerks with input from the providers but primarily from the supported units. The patient flow after duty hours is executed according to the sketch below.



b. C, CSD: In conjunction with the administrative assistants, develops guidelines for scheduling provider time based upon input from external and internal customers.

c. DCCS: Approves any request for exception to provider scheduling and any request to cancel appointments.

ANNEX L-Prevention and Wellness Plans

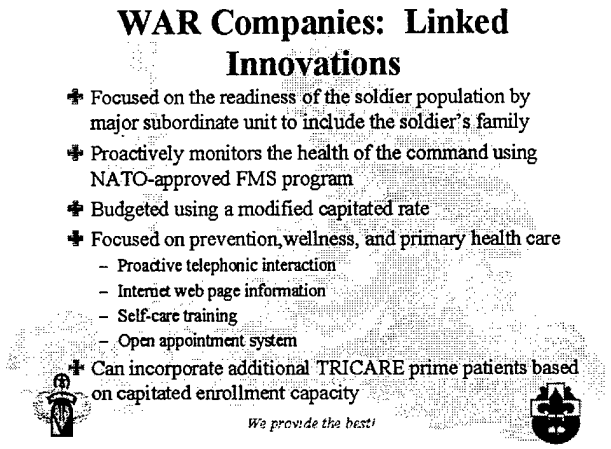
Mission: BJACH reengineers its operation to provide proactive, health-focused, quality care and access for TRICARE Prime patients NLT 15 Jun 1998.

Execution:

a. Concept of the Operation

(1) Prevention and Readiness Process Interventions

The innovations depicted below represent some of the proposed and approved concepts which will assist BJACH in becoming the leader in prevention and readiness, a key element in BJACH's vision. As part of this evolution, each of the WAR Companies will institute a comprehensive prevention/care management plan.



(2) Augmentation Phone Center

Registered Nurses (RNs) and Licensed Practical Nurses (LPNs) assigned to WAR Companies will begin an active phone campaign, answering their customers' questions and calling them proactively for health promotion measures. In order to track the requirements and satisfaction of their patients, a comprehensive database is required.

(3) Prevention Web Pages

BJACH will host prevention pages for its patients and other customers and begin advertising these efforts through the installation paper and television channel.

(4) Self-care Training

BJACH will institute self-care training and certify individuals to access an Internet site and schedule a clinic appointment from home beginning July 1998. The self-care training will also allow these patients to receive over-the-counter medications without a doctor's prescription. Eventually, this self-care training will allow them to schedule appointments through Internet access.

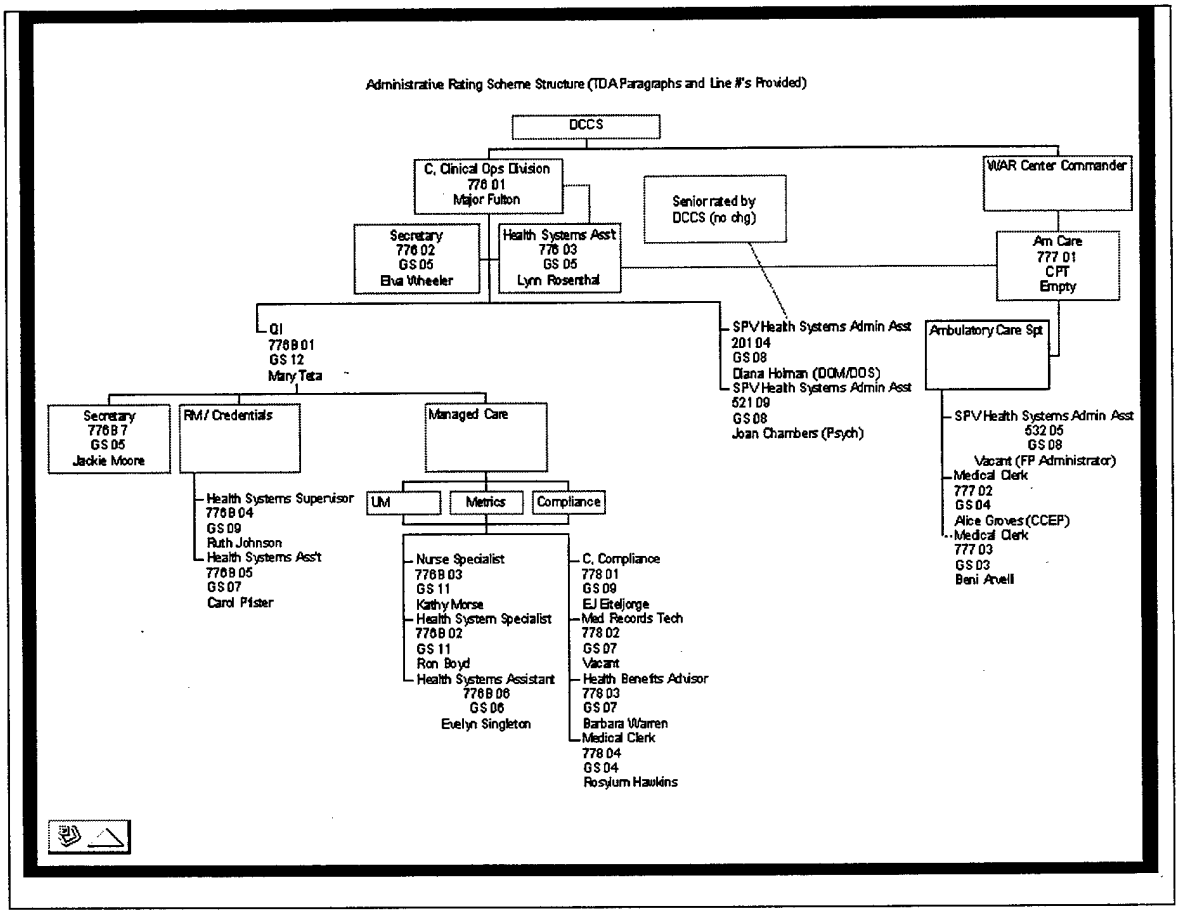
(5) Command Health Report

BJACH will leverage the relationship between the individual command and the hospital to provide command health information. The command health information will be integrated into Fort Polk's Unit Status Reporting. The means of attaining this end is through a comprehensive networked computer program.

(6) PPIP Initiatives and Readiness Monitoring

Each team will maintain and track the readiness of its population and adopt PPIP initiatives.

ANNEX M-Administrative Reorganization Plan



ANNEX N-Empanelment Plan

Mission: BJACH appropriately empanels TRICARE PRIME patients IAW command guidance NLT 010700JUN1998.

Execution

a. Concept of the Operation: Personnel inprocessing Fort Polk are required to turn in their medical records at BJACH. During this process, BJACH has the opportunity to both empanel, educate, and obtain information necessary to maintain the provider panels.

b. Tasks to Subordinates:

(1) PAD will provide ***both*** handouts and verbal information to patients turning in medical records about their team. Additionally, PAD will ensure that patients fill in a sign-in sheet and the attached questionnaire to capture the pertinent data. PAD will provide the sign-in sheets to the empanelment clerk at the end of each day.

(2) Managed care will provide enrollment lists from Foundation Health to the designated empanelment clerk for comparison.

(3) The empanelment clerk / designated civilian will mail brochures, letters, etc. to any persons not found on the PAD sign-in sheet.

c. Coordinating Instructions.

(1) Changes to this plan will NOT be official unless provided in writing.

(2) Coordination with AO encouraged (531-3111).

APPENDIX 1 TO ANNEX N, EMPANELMENT PLAN

Last Name: _____ First Name: _____ Middle Initial:_____

Unit: _____ Grade:_____ SSN: _____

Are you enrolled in TRICARE Prime? (Active Duty check the block.) ☐

Dependents:

Last Name	First Name	Age	Enrolled in Prime
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐

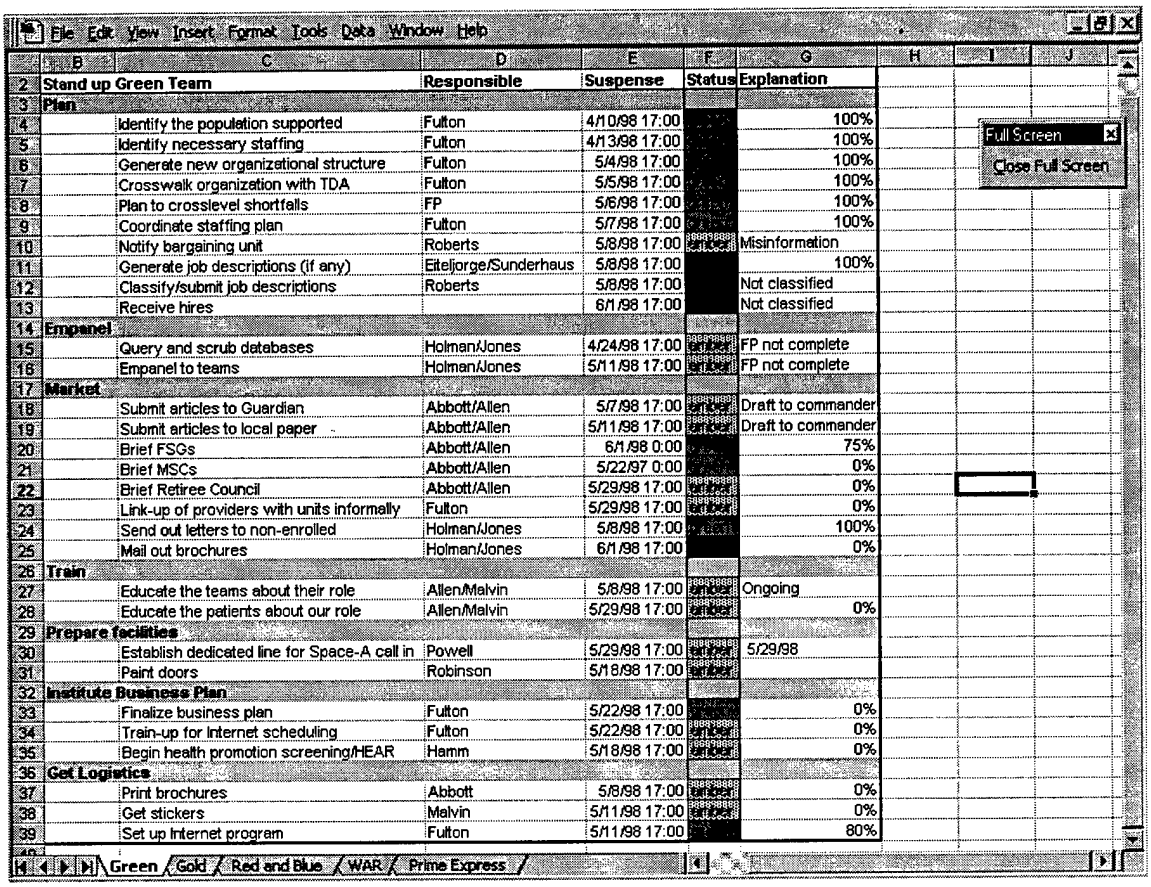
ANNEX O-Union Employees Affected

Department/Division/Section	#	Move?	Rater?	Sr Rater?	Hours?
Social Work Service	4	4	0	0	0
ADAPCP	0	[redacted]	[redacted]	[redacted]	[redacted]
Department of Psychiatry	4	4	0	0	0
Operations and Training Division	3	3	0	0	0
Department of Medicine	15	15	0	0	0
Department of Family Practice		0	?	?	?
Troop Medical Clinic	11	11	?	?	?
Preventive Medicine Service	13	13	0	0	0
Records Management	1	1	0	0	0
Auditors	0	[redacted]	[redacted]	[redacted]	[redacted]
Safety	2	2	0	0	0
Total	**53**	**53**	**0**		**?**

ANNEX P-Metrics

Under development

ANNEX Q-Tracking Logs (Example)



File Edit View Insert Format Tools Data Window Help

	B	C	D	E	F	G	H	I	J
2	**Stand up Green Team**		**Responsible**	**Suspense**	**Status**	**Explanation**			
3	**Plan**								
4		Identify the population supported	Fulton	4/10/98 17:00		100%			
5		Identify necessary staffing	Fulton	4/13/98 17:00		100%			
6		Generate new organizational structure	Fulton	5/4/98 17:00		100%			
7		Crosswalk organization with TDA	Fulton	5/5/98 17:00		100%			
8		Plan to crosslevel shortfalls	FP	5/6/98 17:00		100%			
9		Coordinate staffing plan	Fulton	5/7/98 17:00		100%			
10		Notify bargaining unit	Roberts	5/8/98 17:00		Misinformation			
11		Generate job descriptions (if any)	Eiteljorge/Sunderhaus	5/8/98 17:00		100%			
12		Classify/submit job descriptions	Roberts	5/8/98 17:00		Not classified			
13		Receive hires		6/1/98 17:00		Not classified			
14	**Empanel**								
15		Query and scrub databases	Holman/Jones	4/24/98 17:00		FP not complete			
16		Empanel to teams	Holman/Jones	5/11/98 17:00		FP not complete			
17	**Market**								
18		Submit articles to Guardian	Abbott/Allen	5/7/98 17:00		Draft to commander			
19		Submit articles to local paper	Abbott/Allen	5/11/98 17:00		Draft to commander			
20		Brief FSGs	Abbott/Allen	6/1/98 0:00		75%			
21		Brief MSCs	Abbott/Allen	5/22/97 0:00		0%			
22		Brief Retiree Council	Abbott/Allen	5/29/98 17:00		0%			
23		Link-up of providers with units informally	Fulton	5/29/98 17:00		0%			
24		Send out letters to non-enrolled	Holman/Jones	5/8/98 17:00		100%			
25		Mail out brochures	Holman/Jones	6/1/98 17:00		0%			
26	**Train**								
27		Educate the teams about their role	Allen/Malvin	5/8/98 17:00		Ongoing			
28		Educate the patients about our role	Allen/Malvin	5/29/98 17:00		0%			
29	**Prepare facilities**								
30		Establish dedicated line for Space-A call in	Powell	5/29/98 17:00		5/29/98			
31		Paint doors	Robinson	5/18/98 17:00					
32	**Institute Business Plan**								
33		Finalize business plan	Fulton	5/22/98 17:00		0%			
34		Train-up for Internet scheduling	Fulton	5/22/98 17:00		0%			
35		Begin health promotion screening/HEAR	Hamm	5/18/98 17:00		0%			
36	**Get Logistics**								
37		Print brochures	Abbott	5/8/98 17:00		0%			
38		Get stickers	Malvin	5/11/98 17:00		0%			
39		Set up Internet program	Fulton	5/11/98 17:00		80%			

Full Screen
Close Full Screen

Green / Gold / Red and Blue / WAR / Prime Express /

Appendix K - Staffing Action for 36th Medical Detachment (Air Ambulance)

JRTC AND FORT POLK ACTION TRANSMITTAL

SUBJECT: Assignment of U.S. Army Air Ambulance Detachment (USAAAD, Fort Polk) to U.S. Army Medical Activity (USAMEDDAC, Fort Polk)	DATE: 05/23/98
REASON FOR ACTION: **Gain Approval from the Commanding General for Assignment of USAAAD to MEDDAC, Fort Polk.)**	**SUSPENSE: N/A**

FACTS OR DISCUSSION:

1. **This is a decision paper.**

2. **PURPOSE.** To obtain the Commanding General's approval for the assignment of the U.S. Army Air Ambulance Detachment (TDA) to the United States Army Medical Activity (USAMEDDAC).

3. **REFERENCE.** FP Form 7e dated 25 July 1997, SUBJECT: United States Army Air Ambulance Detachment (TAB B)

4. **DISCUSSION:** Effective 15 Jun 98, the 36th Medical Detachment will deactivate, and its personnel and equipment will be used to activate the U.S. Army Air Ambulance Detachment (TDA). The command and control of the detachment is currently not specified; however, a proposal from DRM would attach the unit to Warrior Brigade (TAB B). Assigning the detachment to the MEDDAC would better integrate both training and real-world health service support by providing the Director of Health Services / MEDDAC Commander / JRTC Surgeon the assets needed to carry out the entire medical mission. The command relationship would additionally serve to bolster training and aeromedical evacuation in JRTC. Better training of the detachment equates to better readiness of its soldiers after reassignment. The hospital can provide operations and logistics support with existing staff. Precedence exists for this action at Fort Rucker, Alabama, where the aeromedical evacuation flight detachment is assigned directly to USAMEDDAC. TAB A, the Implementation Memorandum, directs the assignment of the U.S. Army Air Ambulance Detachment (TDA) to the MEDDAC.

5. **RECOMMENDATION:** That the Commanding General direct the assignment of the U.S. Army Air Ambulance Detachment (TDA) to USAMEDDAC, Fort Polk, by signing the directive at TAB A.

RESOURCE IMPACT:
None. The unit would still be funded through FORSCOM with command and control at USAMEDDAC, Fort Polk.

RECOMMENDATIONS:
That the Commanding General approve the assignment of the U.S. Army Air Ambulance Detachment (TDA) to USAMEDDAC, Fort Polk, by signing the implementation memorandum at TAB A.

ACTION OFFICER/PHONE NUMBER:	NAME/SIGNATURE OF SECTION CHIEF:
LAWRENCE V. FULTON CPT PTMS/BJACH, 3111, FAX 3050	C. WILLIAM FOX, JR. COL CDR, BJACH/JRTC SURGEON

CONSIDERATION OF NONCONCURRENCE OR STAFF COMMENTS: NA OR SEE CONTINUATION SHEET TAB _____

COORDINATION					HQ SECTION				
SECTION	NAME	CONCUR	INITIALS	DATE		APVL	INFO	INITIALS	DATE
Cdr, WB					GC		X		
G3/DPTMS									
G1/AG					CSM		X		
DOL									
DPW					DC/CS		X		
SJA									
DRM					CDR	X			

FP Form 7-E (Rev), 1 Jan 97 (Designed in MS-Word) Previous Edition is Obsolete

Appendix L - Operational Definitions

Table 1. This table reflects basic operational definitions for each component of the hypothesis. Definitions are excerpted from Ivancevich and Matteson (1995).

Component	Definition	Measured
Production	Organization output	Primary care visits / staff member
Efficiency	Minimized inputs	Cost / beneficiary user (total and by clinic)
Satisfaction	Internal gratification	Not measured: "after the fact" metric
Adaptiveness	Responsiveness to change	Not measured
Development	Ability to increase responsiveness	% actual utilization of personnel, patient wait time

"Production" in the Strategic MedModel® is measured in primary care clinic visits divided by the number of on-hand staff members. As an organizational output, this measure reflects the number of contacts with patients for each staff member.

"Efficiency" is measured as cost per beneficiary. The efficiency rating is always a ratio (Ivancevich & Matteson, 1995), and costs per beneficiary provide a standardized view of the business processes.

"Internal satisfaction" or gratification is difficult to measure prior to implementing systemic change. According to P.C. Smith, L.M. Kendall, and C.L. Hulin (1969), the five key dimensions of job satisfaction include: the amount and equity of pay received, the interestingness and opportunities of the job, promotion opportunities, the supervisor, and coworkers. With fixed pay, promotion opportunities, random supervisors, and random coworkers, the only surviving dimension for military workers is job interestingness and opportunities. Ivancevich and Matteson (1995) suggest that measures of satisfaction include employee attitudes, turnover, absenteeism, tardiness, and grievance. All of these indicators are better evaluated after changes have been completed; therefore internal satisfaction is excluded from the modeling. (External

gratification, not mentioned in the definition of effectiveness, may also be used as a metric to judge effectiveness after the interventions have been implemented.)

"Adaptiveness" (also known as flexibility) is the organization's responsiveness to change. According to Ivancevich and Matteson (1995), there are no concrete measures of this trait.

"Development" refers to the ability to increase its responsiveness and may be measured using time dimensions (Ivancevich & Matteson, 1995). For purposes of this research, this trait is modeled by evaluating percent utilization of personnel and patient wait time averages.

Appendix M - Regression Analysis of Number of Visits on Cost per Visit

Finstuen Ten-Step (Modified) Analysis of Cost per Visit by Visits

1. Population = Outpatient Clinic Visits for BJACH, Sample = Monthly visits for 12 mo's
2. X1 = # of FP visits (ratio); X2 = # of ER visits (ratio); Y1 = Cost per Visit (FP) and Y2 = Cost per Visit (ER)
3. Ha: Y1 = f(X); Ho: Y1 <> f(X); Ha: Y2=f(X); Ho: Y2<>f(X)
4. Ha: Cost per visit (FP) is a function of # of visits; Cost per visit (ER) is a function
5. Alpha = .05
6. Descriptives

Descriptive Statistics

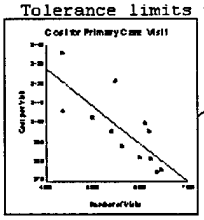
	N	Range	Minimum	Maximum	Sum	Mean		Std.	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
FP Cost per Visit	12	60.58	75.01	135.57	1157.84	96.4867	5.2453	18.1702	330.158	.916	.637	.581	1.232
FP # of visits	12	2094.00	4348.00	6442.00	67442.00	5620.1667	211.8808	733.2831	537704.2	-.798	.637	-.547	1.232
ER Cost per Visit	12	132.57	145.72	278.29	2407.88	200.6400	11.6024	40.1921	1615.402	.240	.637	-.589	1.232
ER # of visits	12	747.00	1973.00	2720.00	27210.00	2267.5000	71.4313	247.4453	61229.182	.732	.637	-.907	1.232
Valid N (listwise)	12												

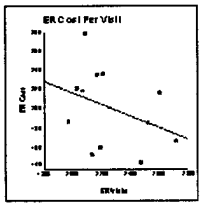
7. Inferentials

Dependent	Mth	Rsq	d.f.	F	Sigf	Upper bound	b0	b1	b2	b3
COST	LIN	.602	10	15.15	.003		204.578	-.0192		
COST	LOG	.595	10	14.69	.003		972.111	-101.51		
COST	INV	.585	10	14.08	.004		1.0412	527136		
COST	QUA	.608	9	6.98	.015		116.568	.0141	-3.E-06	
9 COST	CUB	.609	9	7.00	.015		142.362	-.0015		-2.E-10
COST	**COM**	**.614**	**10**	**15.89**	**.003**		**280.968**	**.9998**		
COST	POW	.602	10	15.10	.003		599391	-1.0144		
COST	S	.587	10	14.21	.004		3.6039	5247.61		
COST	GRO	.614	10	15.89	.003		5.6382	-.0002		
COST	EXP	.614	10	15.89	.003		280.968	-.0002		
COST	LGS	.614	10	15.89	.003	.	.0036	1.0002		

Notes:

9 Tolerance limits reached; some dependent variables were not entered.





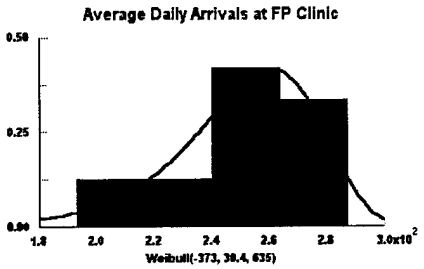
Dependent	Mth	Rsq	d.f.	F	Sigf	Upper bound	b0	b1	b2	b3
COST2	LIN	.128	10	1.47	.253		332.430	-.0581		
COST2	LOG	.127	10	1.46	.255		1242.92	-134.99		
COST2	INV	.126	10	1.44	.257		62.3440	310358		
COST2	QUA	.128	9	.66	.540		315.475	-.0435	-3.E-06	
9 COST2	CUB	.128	9	.66	.540		315.475	-.0435	-3.E-06	
COST2	COM	.124	10	1.42	.261		376.302	.9997		
COST2	POW	.124	10	1.42	.261		33496.9	-.6652		
COST2	S	.124	10	1.42	.262		4.5992	1534.77		
COST2	GRO	.124	10	1.42	.261		5.9304	-.0003		
COST2	EXP	.124	10	1.42	.261		376.302	-.0003		
COST2	LGS	.124	10	1.42	.261	.	.0027	1.0003		

Notes:

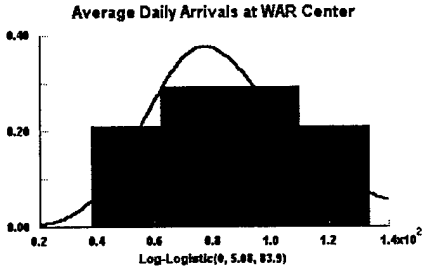
9 Tolerance limits reached; some dependent variables were not entered.

8. Reject Ho; Accept Ha:Y1 = f(X1) 9. R^2 = 61.4%, F(1,10) =15.89, p = .003
but Accept Ho: Y2<>f(X2) 10. The small sample size limits

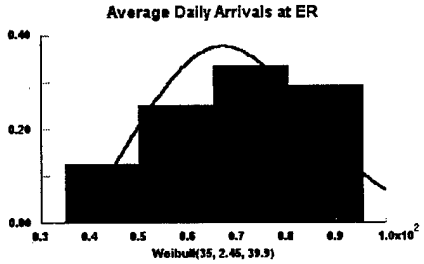
Appendix N - Small Multiples of Distributions Used in Simulation



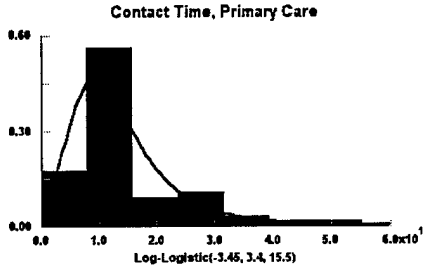
n = 24 months, no statistically significant difference between distribution and data



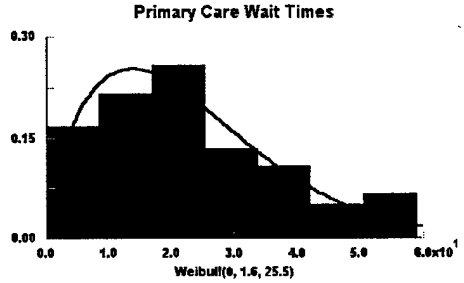
n = 24 months, no statistically significant difference between distribution and data



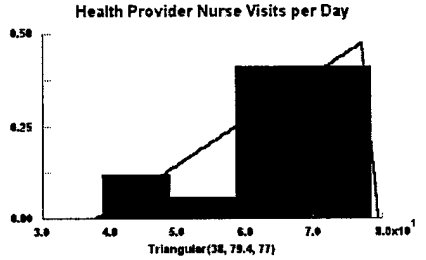
n = 24 months, Average arrivals to ER, no statistically significant difference between distribution and data



n = 120 observations, no statistically significant difference between distribution and data



n = 120 observations, no statistically significant difference between distribution and data



n = 24 months, no statistically significant difference between the distribution and the data

Appendix O - Code Used to Design MedModel® Simulation

```
*******************************************************************************
*                                                                             *
*                        Formatted Listing of Model:                          *
*                        C:\MEDMOD3\MODELS\NEW56.MOD                          *
*                                                                             *
*******************************************************************************

  Model Notes:
#
#This simulation (based on CEIS, MEPRS, CHCS, and empirical distributions)
 provides insight into the operation of Bayne-Jones Army Community Hospital.
  Clinic visits, provider utilization, and cost are the three variables
 of most interest in this study.
#
#Casper
  Time Units:                          Minutes
  Distance Units:                      Feet
  Initialization Logic:                activate clocks
                                       activate arrivalgraph
                                       activate costperbenegraph
                                       activate percentusage
                                       activate costroutine
                                       activate patperhourgraph
                                       activate costgraph
                                       reset report1
                                       activate reports

                                       /*prompt "WELCOME to Bayne-Jones Army Community Hospital!  Enter
the number of total beneficiaries assigned to the hospital catchment area.", beneficiaries_assigned
                                       prompt "How many patients do you want to empanel to the WAR
Center?",assigned_to_warcenter
                                       prompt "What is the predicted rotational troops strength for
TMC4?", assigned_to_TMC4
                                       display "The number of patients assigned to family practice is ",
beneficiaries_assigned-assigned_to_warcenter
                                       prompt "Input the number of health promotion nurses you want to
assign to the WAR Center.", hpns
                                       prompt "Input the number of health promotion nurses you want to
assign to the FP Clinic.", hpns2
                                       Prompt "The impact of prevention dollars on visit rate.", prevent
                                       assigned_to_fp = beneficiaries_assigned-assigned_to_warcenter
                                       entriesctmc = (entriesctmc*(assigned_to_warcenter/8000))*(1-
prevent)
                                       entriesfp=(entriesfp*((beneficiaries_assigned-
assigned_to_warcenter)/24000))*(1-prevent )*/

                                       beneficiaries_assigned = 32000
                                       assigned_to_warcenter = 8000
                                       assigned_to_TMC4 = 6000
                                       hpns=0
                                       hpns2=0
                                       prevent = 0
                                       assigned_to_fp = beneficiaries_assigned-assigned_to_warcenter
                                       entriesctmc = (entriesctmc*(assigned_to_warcenter/8000))*(1-
prevent)
                                       entriesfp=(entriesfp*((beneficiaries_assigned-
assigned_to_warcenter)/24000))*(1-prevent )

  Termination Logic:



*******************************************************************************
*                                  Locations                                  *
*******************************************************************************

  Name       Cap      Units Stats       Rules           Cost
  ---------- -------- ----- ----------- --------------- ------------
  entryctmc  infinite 1     Time Series Oldest, ,
  entryfp    infinite 1     Time Series Oldest, ,
  entrytmc4  infinite 1     Time Series Oldest, ,
  entryer    inf      1     Time Series Oldest, ,
  ctmcq      INFINITE 1     Time Series Oldest, ,
  fpaq       INFINITE 1     Time Series Oldest, ,
  tmc4q      INFINITE 1     Time Series Oldest, ,
  erq        INFINITE 1     Time Series Oldest, ,
```

ctmc	25	1	Time Series Oldest, ,	
fpa	25	1	Time Series Oldest, ,	
tmc4	2	1	Time Series Oldest, ,	
emr	4	1	Time Series Oldest, ,	
exits	inf	1	Time Series Oldest, ,	
obgyn	3	1	Time Series Oldest, ,	
peds	2	1	Time Series Oldest, ,	
im	3	1	Time Series Oldest, ,	
obq	INFINITE	1	Time Series Oldest, ,	
pedsq	INFINITE	1	Time Series Oldest, ,	
imq	INFINITE	1	Time Series Oldest, ,	
exitq	INFINITE	1	Time Series Oldest, ,	
entryobgyn	1	1	Time Series Oldest, ,	
entrypeds	1	1	Time Series Oldest, ,	
entryim	1	1	Time Series Oldest, ,	
entrysds	1	1	Time Series Oldest, ,	
sdsq	INFINITE	1	Time Series Oldest, ,	
sds	3	1	Time Series Oldest, ,	
Ortho	3	1	Time Series Oldest, ,	
Psych	15	1	Time Series Oldest, ,	
SWS	10	1	Time Series Oldest, ,	
ptot	6	1	Time Series Oldest, ,	
orthoq	INFINITE	1	Time Series Oldest, ,	
psychq	INFINITE	1	Time Series Oldest, ,	
swsq	INFINITE	1	Time Series Oldest, ,	
ptotq	INFINITE	1	Time Series Oldest, ,	
entryortho	1	1	Time Series Oldest, ,	
entrypsych	1	1	Time Series Oldest, ,	
entrysws	1	1	Time Series Oldest, ,	
entryptot	1	1	Time Series Oldest, ,	
entryhpn1	inf	1	Time Series Oldest, ,	
entryhpn2	inf	1	Time Series Oldest, ,	
graph1	50	1	Time Series Oldest, ,	First
graph2	50	1	Time Series Oldest, ,	
graph3	50	1	Time Series Oldest, ,	
graph4	50	1	Time Series Oldest, ,	
graph5	50	1	Time Series Oldest, ,	
graph6	500	1	Time Series Oldest, ,	
graph7	500	1	Time Series Oldest, ,	
graph8	500	1	Time Series Oldest, ,	
graph9	500	1	Time Series Oldest, ,	
graph10	500	1	Time Series Oldest, ,	
graph11	5	1	Time Series Oldest, ,	
graph12	5	1	Time Series Oldest, ,	
graph13	5	1	Time Series Oldest, ,	
graph14	5	1	Time Series Oldest, ,	
graph15	5	1	Time Series Oldest, ,	
graph16	500	1	Time Series Oldest, ,	
graph17	500	1	Time Series Oldest, ,	
graph18	500	1	Time Series Oldest, ,	
graph19	500	1	Time Series Oldest, ,	
graph20	500	1	Time Series Oldest, ,	

****
* Clock downtimes for Locations *
****

Loc	Frequency	First Time	Priority	Scheduled	Disable	Logic
entrytmc4	168 hr	120 hr	199	Yes	No	wait 48 hr
ctmc	24hr	0	199	Yes	No	^ 6hr
	24hr	17hr	199	Yes	No	^ 7hr
	168 hr	120 hr	199	Yes	No	^48 hr
fpa	24hr	0	199	Yes	No	wait 8 hr
	24 hr	17 hr	199	Yes	No	wait 7 hr
	168 hr	120 hr	199	Yes	No	wait 48 hr
obgyn	24hr	0	199	Yes	No	wait 8 hr
	24hr	17hr	199	Yes	No	wait 7 hr
	168 hr	120 hr	199	Yes	No	wait 48 hr
peds	24 hr	0	199	Yes	No	wait 8 hr
	24 hr	17hr	199	Yes	No	wait 7 hr
	168 hr	120 hr	199	Yes	No	wait 48 hr
im	24 hr	0	199	Yes	No	wait 8 hr
	24 hr	17hr	199	Yes	No	wait 7hr
	168 hr	120 hr	199	Yes	No	wait 48 hr
sds	24 hr	0	199	Yes	No	wait 8 hr
	24 hr	17 hr	199	Yes	No	wait 7hr
	168 hr	120 hr	199	Yes	No	wait 48 hr
Ortho	24hr	0	199	Yes	No	wait 8 hr
	24 hr	17hr	199	Yes	No	wait 7hr

	168 hr	120 hr	199	Yes	No	wait 48 hr
Psych	24 hr	0	199	Yes	No	wait 8 hr
	24 hr	17 hr	199	Yes	No	wait 7 hr
	168 hr	120 hr	199	Yes	No	wait 48 hr
SWS	24 hr	0	199	Yes	No	wait 8 hr
	24 hr	17 hr	199	Yes	No	wait 7 hr
	168 hr	120 hr	199	Yes	No	wait 48 hr
ptot	24 hr	0	199	Yes	No	wait 8 hr
	24 hr	17 hr	199	Yes	No	wait 7 hr
	168 hr	120 hr	199	Yes	No	wait 48 hr

Entities

Name	Speed (fpm)	Stats	Cost
patient	114	Time Series	120
hpnmarker	114	Time Series	
dynamic_marker	114	Time Series	

Path Networks

Name	Type	T/S	From	To	BI	Dist/Time	Speed Factor
Net1	Passing	Speed & Distance	N1	N2	Bi	13.14	1
			N2	N3	Bi	2.94	1
			N3	N4	Bi	5.87	1
			N3	N5	Bi	9.14	1
			N5	N6	Bi	0.60	1
			N5	N7	Bi	9.00	1
			N7	N8	Bi	4.89	1
			N9	N10	Bi	9.00	1
			N4	N11	Bi	42.32	1
			N6	N11	Bi	41.31	1
			N11	N8	Bi	23.41	1
			N12	N13	Bi	12.09	1
			N13	N3	Bi	4.60	1
			N13	N5	Bi	5.49	1
			N14	N5	Bi	5.75	1
			N14	N7	Bi	4.91	1
			N15	N14	Bi	10.90	1
			N16	N17	Bi	10.21	1
			N17	N7	Bi	5.31	1
			N11	N18	Bi	0.60	1
			N13	N11	Bi	46.05	1
			N14	N11	Bi	46.91	1
			N17	N11	Bi	27.72	1
			N2	N11	Bi	51.56	1
			N10	N11	Bi	16.14	1
			N19	N5	Bi	0.31	1
			N20	N7	Bi	0.28	1
			N21	N3	Bi	2.21	1
			N21	N22	Bi	0.90	1
			N22	N23	Bi	9.17	1
			N5	N24	Bi	2.30	1
			N24	N25	Bi	1.42	1
			N25	N26	Bi	8.45	1
			N7	N27	Bi	1.76	1
			N27	N28	Bi	1.45	1
			N28	N29	Bi	9.03	1
			N7	N30	Bi	4.85	1
			N30	N9	Bi	48.37	1
			N30	N31	Bi	2.72	1
			N31	N32	Bi	1.45	1
			N32	N33	Bi	8.35	1
			N34	N9	Bi	42.04	1
			N35	N36	Bi	1.85	1
			N36	N37	Bi	8.68	1
			N38	N39	Bi	0.58	1
			N39	N40	Bi	10.16	1
			N41	N42	Bi	0.60	1
			N42	N43	Bi	9.74	1
			N44	N45	Bi	0.95	1
			N45	N46	Bi	8.58	1
			N46	N11	Bi	5.23	1
			N40	N11	Bi	24.71	1

```
                                    N43       N11       Bi    15.17       1
                                    N37       N11       Bi    31.06       1

*****************************************************************************
*                                  Interfaces                               *
*****************************************************************************

  Net         Node        Location
  ----------- ----------- ----------
  Net1        N1          ctmcq
              N12         fpaq
              N15         tmc4q
              N16         erq
              N17         emr
              N14         tmc4
              N13         fpa
              N2          ctmc
              N18         exitq
              N1          entryctmc
              N12         entryfp
              N15         entrytmc4
              N16         entryer
              N18         exits
              N21         entryobgyn
              N22         obq
              N23         obgyn
              N24         entrypeds
              N25         pedsq
              N26         peds
              N27         entryim
              N28         imq
              N29         im
              N31         entrysds
              N32         sdsq
              N33         sds
              N35         entryortho
              N36         orthoq
              N37         Ortho
              N38         entrypsych
              N39         psychq
              N40         Psych
              N41         entrysws
              N42         swsq
              N43         SWS
              N44         entryptot
              N45         ptotq
              N46         ptot
              N1          entryhpn1
              N12         entryhpn2

*****************************************************************************
*                                  Resources                                *
*****************************************************************************

                                Res     Ent
  Name      Units Stats         Search  Search Path       Motion          Cost
  --------- ----- ------------- ------- ------ ---------- --------------- ------------
  fpdr      18    By Unit       Closest Oldest Net1       Empty: 114 fpm 200/day
                                                Home: N13  Full: 114 fpm

  ctmcdr    12    By Unit       Closest Oldest Net1       Empty: 114 fpm 200/day
                                                Home: N2   Full: 114 fpm

  tmc4dr    2     By Unit       Closest Oldest Net1       Empty: 114 fpm 0/day
                                                Home: N14  Full: 114 fpm

  erdr      5     By Unit       Closest Oldest Net1       Empty: 114 fpm 225/day
                                                Home: N17  Full: 114 fpm

  obdr      3     By Unit       Closest Oldest Net1       Empty: 114 fpm 250/day
                                                Home: N23  Full: 114 fpm

  peddr     2     By Unit       Closest Oldest Net1       Empty: 114 fpm 300/day
                                                Home: N26  Full: 114 fpm

  imdr      3     By Unit       Closest Oldest Net1       Empty: 114 fpm 300/day
                                                Home: N29  Full: 114 fpm

  sdsdr     3     By Unit       Closest Oldest Net1       Empty: 114 fpm 325/day
```

```
                                        Home: N33  Full: 114 fpm

  orthodr   3     By Unit  Closest Oldest Net1       Empty: 114 fpm 400/day
                                        Home: N37  Full: 114 fpm

  psychdr   15    By Unit  Closest Oldest Net1       Empty: 114 fpm 200/day
                                        Home: N40  Full: 114 fpm

  swsdr     10    By Unit  Closest Oldest Net1       Empty: 114 fpm 150/day
                                        Home: N43  Full: 114 fpm

  ptotdr    6     By Unit  Closest Oldest Net1       Empty: 114 fpm 200/day
                                        Home: N46  Full: 114 fpm

  bargraph  1     By Unit  Closest Oldest Net1       Empty: 114 fpm
                                        Home: N1   Full: 114 fpm

  hpnnurse1 5     By Unit  Closest Oldest Net1       Empty: 114 fpm
                                        Home: N1   Full: 114 fpm

  hpnnurse2 5     By Unit  None    Oldest            Empty: 114 fpm
                                                     Full: 114 fpm


*****************************************************************************
*                        Clock downtimes for Resources                      *
*****************************************************************************

  Res       Frequency  First Time Priority   Scheduled Node     List     Disable Logic
  --------- ---------- ---------- ---------- --------- -------- -------- ------- ------------
  fpdr      24hr       0          199        Yes                         No      wait 8hr
            24hr       17hr       199        Yes                         No      wait 7hr
            168 hr     120hr      199        Yes                         No      wait 48 hr
  ctmcdr    24hr       0          199        Yes                         No      wait 6 hr
            24hr       17hr       199        Yes                         No      wait 7 hr
            168 hr     120hr      199        Yes                         No      wait 48 hr
  tmc4dr    168 hr     120 hr     199        Yes                         No      wait 48 hr
  obdr      24hr       0          199        Yes                         No      wait 8 hr
            24 hr      17 hr      199        Yes                         No      wait 7 hr
            168 hr     120 hr     199        Yes                         No      wait 48 hr
  peddr     24 hr      0                     Yes                         No      wait 8hr
            24 hr      17 hr                 Yes                         No      wait 7hr
            168 hr     120 hr                Yes                         No      wait 48 hr
  imdr      24hr       0                     Yes                         No      wait 8hr
            24hr       17hr                  Yes                         No      wait 7hr
            168 hr     120 hr                Yes                         No      wait 48 hr
  sdsdr     24hr       0          199        Yes                         No      wait 8 hr
            24hr       17hr       199        Yes                         No      wait 7hr
            168 hr     120 hr     199        Yes                         No      wait 48 hr
  orthodr   24 hr      0          199        Yes                         No      wait 8 hr
            24 hr      17 hr      199        Yes                         No      wait 7 hr
            168 hr     120 hr     199        Yes                         No      wait 48 hr
  psychdr   24hr       0          199        Yes                         No      wait 8 hr
            24 hr      17 hr      199        Yes                         No      wait 7 hr
            168 hr     120 hr     199        Yes                         No      wait 48 hr
  swsdr     24 hr      0          199        Yes                         No      wait 8 hr
            24 hr      17 hr      199        Yes                         No      wait 7hr
            168 hr     120 hr     199        Yes                         No      wait 48 hr
  ptotdr    24hr       0          199        Yes                         No      wait 8 hr
            24 hr      17 hr      199        Yes                         No      wait 7hr
            168 hr     120 hr     199        Yes                         No      wait 48 hr
  bargraph  5 min      0                     No                          No      zulu = clock(hr)
                                                                                 if ptperhour < 2 then
goto jest1

                                                                                 if ptperhour<3.5 then
goto jest2

                                                                                 if ptperhour >=3.5
then goto jest3

                                                                                 jest1:
                                                                                 graphic 3
                                                                                 goto bye
                                                                                 jest2:
                                                                                 graphic 2
                                                                                 goto bye
                                                                                 jest3:
                                                                                 graphic 1
                                                                                 goto bye
                                                                                 bye:
                                                                                 wait 10 min

            24 hr      0                     No                          No      graphic 4
```

```
                                                                                wait 60 min
 hpnnurse1 24 hr      0          299        Yes                        No      wait 8 hr
           24 hr      17         299        Yes                        No      wait 7 hr
           168 hr     120 hr     299        Yes                        No      wait 48 hr
 hpnnurse2 24 hr      0          299        Yes                        No      wait 8 hr
           24 hr      17         299        Yes                        No      wait 7 hr
           168 hr     120 hr     299        Yes                        No      wait 48 hr


*****************************************************************************
*                        Usage downtimes for Resources                      *
*****************************************************************************

 Res        Frequency  First Time Priority   Node     List      Logic
 ---------  ---------- ---------- ---------- -------- --------- ------------------
 fpdr       24 hr      0          299                 fpmacro   wait 24hr
 ctmcdr     24 hr      0          299                 ctmcmacro wait 24 hr
 erdr       24 hr      0          299                 ermacro   wait 24hr
 hpnnurse1  24 hr      0          299                 hpn1macro wait 24 hr
 hpnnurse2  24 hr      0          299                 hpn2macro wait 24hr


*****************************************************************************
*                                Processing                                 *
*****************************************************************************

                                    Process                          Routing

 Entity         Location   Operation            Blk Output         Destination Rule        Move Logic
 -------------- ---------- -------------------  --- -------------- ----------- ----------  ----------
-
 hpnmarker      entryhpn1  inc warhpn, 1
                           alpha = n(50,25,15)
                           ctmccost=ctmccost+alpha
                           totalcost = totalcost+alpha
                           get hpnnurse1
                           wait n(30,15,33)
                           free all             1   hpnmarker      EXIT        FIRST 1
 hpnmarker      entryhpn2  inc fphpn,1
                           bravo = n(50,25,16)
                           fpcost=fpcost+bravo
                           totalcost=totalcost+bravo
                           get hpnnurse2
                           wait n(30,15,33)
                           free all             1   hpnmarker      EXIT        FIRST 1
 patient        entryctmc  if downqty(ctmc)>=1 then route 2 else route 1
                           pttype=type()
                           if type() = 1 then graphic 1
                           if type() = 2 then graphic 2
                           if type() = 3 then graphic 3
                           if type() = 4 then graphic 4
                           if type() = 5 then graphic 5
                           if type() = 6 then graphic 6
                           if type() = 7 then graphic 7
                           if type() = 8 then graphic 8
                           charlie = costforwarcenter(entriesctmc)
                           ctmccost= ctmccost+charlie
                           totalcost=totalcost+charlie
                           ctmcdol_per_beneficiary = ctmccost/(assigned_to_warcenter)

                           /*CTMC cost is based upon the MEQS
                           MEPRS cost from CEIS, FYTD, from
                           1 Oct 96 through 31 Aug 97. Note:
                           the cost is combined with the FP
                           cost and is therefore less accurate.*/



                                                1   patient        ctmcq       FIRST 1     move on
net1
                                                2   patient        entryer     FIRST 1     move on
net1
 patient        entryfp    if downqty(fpa)>=1 then route 2 else route 1
                           pttype=type()
                           if type() = 1 then graphic 1
                           if type() = 2 then graphic 2
                           if type() = 3 then graphic 3
                           if type() = 4 then graphic 4
                           if type() = 5 then graphic 5
                           if type() = 6 then graphic 6
```

```
                        if type() = 7 then graphic 7
                        if type() = 8 then graphic 8
                        delta = costforfp(entriesfp)
                        fpcost=fpcost+delta
                        totalcost=totalcost+delta
                        fpdol_per_beneficiary = fpcost / (beneficiaries_assigned-
assigned_to_warcenter)
                        /*FP cost is based upon the MEQS
                        MEPRS cost from CEIS, FYTD, from
                        1 Oct 96 through 31 Aug 97.*/
                                              1   patient        fpaq        FIRST 1     move on
net1
                                              2   patient        entryer     FIRST 1     move on
net1
 patient        entrytmc4  pttype=type()
                        if type() = 1 then graphic 1
                        if type() = 2 then graphic 2
                        if type() = 3 then graphic 3
                        if type() = 4 then graphic 4
                        if type() = 5 then graphic 5
                        if type() = 6 then graphic 6
                        if type() = 7 then graphic 7
                        if type() = 8 then graphic 8
                        echo = n(53.91,25,17)
                        tmc4cost=tmc4cost+echo
                        totalcost=totalcost+echo
                        tmc4_per_beneficiary = tmc4cost/(assigned_to_tmc4)
                        /*TMC4 cost is based upon the MEQS
                        MEPRS cost from CEIS, FYTD, from
                        1 Oct 96 through 31 Aug 97.  The
                        6000 represents annual average of
                        rotational soldiers.*/

                                              1   patient        tmc4q       FIRST 1     move on
net1

 patient        entryer    pttype=type()
                        if type() = 1 then graphic 1
                        if type() = 2 then graphic 2
                        if type() = 3 then graphic 3
                        if type() = 4 then graphic 4
                        if type() = 5 then graphic 5
                        if type() = 6 then graphic 6
                        if type() = 7 then graphic 7
                        if type() = 8 then graphic 8
                        foxtrot = n(175.60,50,18)
                        ercost=ercost+foxtrot
                        totalcost=totalcost+foxtrot
                        erdol_per_beneficiary=ercost/beneficiaries_assigned
                        /*ER cost is based upon the MEQS
                        MEPRS cost from CEIS, FYTD, from
                        1 Oct 96 through 31 Aug 97.*/
                                              1   patient        erq         FIRST 1     move on
net1
 patient        entryobgyn pttype=type()
                        if type() = 1 then graphic 1
                        if type() = 2 then graphic 2
                        if type() = 3 then graphic 3
                        if type() = 4 then graphic 4
                        if type() = 5 then graphic 5
                        if type() = 6 then graphic 6
                        if type() = 7 then graphic 7
                        if type() = 8 then graphic 8
                        obcost=obcost+146.86
                        totalcost=totalcost+146.86
                        obgyndol_per_beneficiary=obcost/beneficiaries_assigned
                        /*OB/GYN cost is based upon the MEQS
                        MEPRS cost from CEIS, FYTD, from
                        1 Oct 96 through 31 Aug 97.*/
                                              1   patient        obq         FIRST 1     move on
net1
 patient        entrypeds  pttype=type()
                        if type() = 1 then graphic 1
                        if type() = 2 then graphic 2
                        if type() = 3 then graphic 3
                        if type() = 4 then graphic 4
                        if type() = 5 then graphic 5
                        if type() = 6 then graphic 6
                        if type() = 7 then graphic 7
                        if type() = 8 then graphic 8
                        pedscost=pedscost+104.99
```

```
                        totalcost=totalcost+104.99
                        pedsdol_per_beneficiary=pedscost/beneficiaries_assigned
                        /*Pediatric cost is based upon the MEQS
                        MEPRS cost from CEIS, FYTD, from
                        1 Oct 96 through 31 Aug 97.*/
                                              1   patient        pedsq        FIRST 1     move on
net1
 patient        entryim     pttype=type()
                        if type() = 1 then graphic 1
                        if type() = 2 then graphic 2
                        if type() = 3 then graphic 3
                        if type() = 4 then graphic 4
                        if type() = 5 then graphic 5
                        if type() = 6 then graphic 6
                        if type() = 7 then graphic 7
                        if type() = 8 then graphic 8
                        imcost=imcost+157.23
                        totalcost=totalcost+157.23
                        imdol_per_beneficiary=imcost/beneficiaries_assigned
                        /*IM cost is based upon the MEQS
                        MEPRS cost from CEIS, FYTD, from
                        1 Oct 96 through 31 Aug 97.  Note:
                        the IM cost is really the entire DOM
                        cost.*/               1   patient        imq          FIRST 1     move on
net1
 patient        entrysds    pttype=type()
                        if type() = 1 then graphic 1
                        if type() = 2 then graphic 2
                        if type() = 3 then graphic 3
                        if type() = 4 then graphic 4
                        if type() = 5 then graphic 5
                        if type() = 6 then graphic 6
                        if type() = 7 then graphic 7
                        if type() = 8 then graphic 8
                        sdscost=sdscost+221.89
                        totalcost=totalcost+221.89
                        sdsdol_per_beneficiary=sdscost/beneficiaries_assigned

                        /*SDS cost is based upon the MEQS
                        MEPRS cost from CEIS, FYTD, from
                        1 Oct 96 through 31 Aug 97. The cost
                        includes all SDS procedures*/
                                              1   patient        sdsq         FIRST 1     move on
net1
 patient        entryortho pttype=type()
                        if type() = 1 then graphic 1
                        if type() = 2 then graphic 2
                        if type() = 3 then graphic 3
                        if type() = 4 then graphic 4
                        if type() = 5 then graphic 5
                        if type() = 6 then graphic 6
                        if type() = 7 then graphic 7
                        if type() = 8 then graphic 8
                        orthocost=orthocost+125.69
                        totalcost=totalcost+125.69
                        orthodol_per_beneficiary=orthocost/beneficiaries_assigned
                        /* Ortho cost is based upon the MEQS
                        MEPRS cost from CEIS, FYTD, from
                        1 Oct 96 through 31 Aug 97 and
                        includes cast clinic costs.*/
                                              1   patient        orthoq       FIRST 1     move on
net1
 patient        entrypsych pttype=type()
                        if type() = 1 then graphic 1
                        if type() = 2 then graphic 2
                        if type() = 3 then graphic 3
                        if type() = 4 then graphic 4
                        if type() = 5 then graphic 5
                        if type() = 6 then graphic 6
                        if type() = 7 then graphic 7
                        if type() = 8 then graphic 8
                        psychcost=psychcost+85.64
                        totalcost=totalcost+85.64
                        psychdol_per_beneficiary=psychcost/beneficiaries_assigned
                        /*Psych cost is based upon the MEQS
                        MEPRS cost from CEIS, FYTD, from
                        1 Oct 96 through 31 Aug 97. The cost
                        includes psychology, psychiatry, and
                        child mental health costs.*/
                                              1   patient        psychq       FIRST 1     move on
net1
```

```
patient        entrysws    pttype=type()
                           if type() = 1 then graphic 1
                           if type() = 2 then graphic 2
                           if type() = 3 then graphic 3
                           if type() = 4 then graphic 4
                           if type() = 5 then graphic 5
                           if type() = 6 then graphic 6
                           if type() = 7 then graphic 7
                           if type() = 8 then graphic 8
                           swscost=swscost+158.07
                           totalcost=totalcost+158.07
                           swsdol_per_beneficiary=swscost/beneficiaries_assigned

                           /*SWS cost is based upon the MEQS
                           MEPRS cost from CEIS, FYTD, from
                           1 Oct 96 through 31 Aug 97. The cost
                           includes family advocacy and
                           community mental health as well as
                           SWS*/               1   patient       swsq        FIRST 1     move on
net1
 patient       entryptot   pttype=type()
                           if type() = 1 then graphic 1
                           if type() = 2 then graphic 2
                           if type() = 3 then graphic 3
                           if type() = 4 then graphic 4
                           if type() = 5 then graphic 5
                           if type() = 6 then graphic 6
                           if type() = 7 then graphic 7
                           if type() = 8 then graphic 8
                           ptotcost=ptotcost+63.71
                           totalcost=totalcost+63.71
                           ptotdol_per_beneficiary=ptotcost/beneficiaries_assigned
                           /*PTOT cost is based upon the MEQS
                           MEPRS cost from CEIS, FYTD, from
                           1 Oct 96 through 31 Aug 97.*/

                                               1   patient       ptotq       FIRST 1     move on
net1
 patient       ctmcq       wait 19.1158*(1./((1./U(0.5,0.5))-1.))**(1./2.22298)

                           get ctmcdr          1   patient       ctmc        FIRST 1
 patient       fpaq        wait 19.1158*(1./((1./U(0.5,0.5))-1.))**(1./2.22298)

                           get fpdr            1   patient       fpa         FIRST 1
 patient       tmc4q       get tmc4dr          1   patient       tmc4        FIRST 1
 patient       erq         get erdr            1   patient       emr         FIRST 1
 patient       obq         get obdr            1   patient       obgyn       FIRST 1     move on
net1
 patient       pedsq       get peddr
                                               1   patient       peds        FIRST 1     move on
net1
 patient       imq         get imdr            1   patient       im          FIRST 1     move on
net1
 patient       sdsq        get sdsdr           1   patient       sds         FIRST 1     move on
net1
 patient       orthoq      get orthodr         1   patient       Ortho       FIRST 1     move on
net1
 patient       psychq      get psychdr         1   patient       Psych       FIRST 1     move on
net1
 patient       swsq        get swsdr           1   patient       SWS         FIRST 1     move on
net1
 patient       ptotq       get ptotdr          1   patient       ptot        FIRST 1     move on
net1
 patient       ctmc        inc ctmcpats,1
                           ctmcavgdruse =G(2.3593, 6.08937,30)
                           wait ctmcavgdruse
                           ctmctotaldruse=ctmctotaldruse +ctmcavgdruse
                           free all
                           /*Provider useage distribution is based upon an
                           empirical data set compiled by CPT Neal
                           David for the FP.  Note:  error is
                           immediately induced because of the
                           difference in location. */


                                               1   patient       exitq       FIRST 1     move on
net1
 patient       fpa         inc fpapats,1
                           fpavgdruse=-3.45297+15.5152*(1./((1./U(0.5,0.5))-1.))**(1./3.40146)
                           wait fpavgdruse
```

```
                        fptotaldruse=fptotaldruse+fpavgdruse
                        free all

                        /*Again, provider use is empirically based.*/
                                                1   patient       exitq       FIRST 1     move on
net1
 patient        tmc4    inc tmc4pats,1
                        tmc4avgdruse=  -3.45297+15.5152*(1./((1./U(0.5,0.5,82))-1.))**(1./3.40146)
                        wait tmc4avgdruse
                        tmc4totaldruse=tmc4totaldruse +tmc4avgdruse
                        tmc4percentdruse= (tmc4totaldruse/2)/(clock(hr)*60+clock(min))
                        free all

                        /*Again, a primary care analysis . . .*/

                                                1   patient       exitq       FIRST 1     move on
net1
 patient        emr     inc erpats,1
                        eravgdruse= e(30,83)
                        wait eravgdruse
                        ertotaldruse=(ertotaldruse+eravgdruse)
                        erpercentdruse= (ertotaldruse/5)/(clock(hr)*60+clock(min))

                        free all
                        /*60 minutes reflects the self-reported
                        standard which the ER is routinely
                        meeting.  However, without an
                        empirical distribution the Poisson is
                        used.*/             1   patient       exitq       FIRST 1     move on
net1
 patient        obgyn   inc obpats, 1
                        obavgwait= p(20,85)
                        wait obavgwait
                        obtotalwait=(obtotalwait+obavgwait)
                        obperuse= (obtotalwait/3)/(clock(hr)*60+clock(min))
                        free all

                        /*Again, just a place marker*/

                                                1   patient       exitq       FIRST 1     move on
net1
 patient        peds    inc pedspats, 1
                        pedsavgwait = p(20,86)
                        wait pedsavgwait
                        pedstotalwait=(pedstotalwait+pedsavgwait)
                        pedsperuse= (pedstotalwait/5)/(clock(hr)*60+clock(min))

                        free all
                        /*A placemarker*/
                                                1   patient       exitq       FIRST 1     move on
net1
 patient        im      inc impats,1
                        imavgwait = p(20,87)
                        wait imavgwait
                        imtotalwait=(imtotalwait+imavgwait)
                        imperuse= (imtotalwait/5)/(clock(hr)*60+clock(min))

                        free all
                        /*A placemarker*/
                                                1   patient       exitq       FIRST 1     move on
net1
 patient        sds     inc sdspats,1
                        sdsavgwait = p(45,88)
                        wait sdsavgwait
                        sdstotalwait=(sdstotalwait+sdsavgwait)
                        sdsperuse= (sdstotalwait/5)/(clock(hr)*60+clock(min))

                        free all
                        /*Provider use placemarker*/
                                                1   patient       exitq       FIRST 1     move on
net1
 patient        Ortho   orthopats=orthopats+1
                        orthoavgwait = p(30,89)
                        wait orthoavgwait
                        orthototalwait=(orthototalwait+orthoavgwait)
                        orthoperuse= (orthototalwait/5)/(clock(hr)*60+clock(min))
                        free all            1   patient       exitq       FIRST 1     move on
net1
 patient        Psych   inc psychpats,1
                        psyavgwait = p(30,90)
```

```
                        wait psyavgwait
                        psytotalwait=(psytotalwait+psyavgwait)
                        psyperuse= (psytotalwait/5)/(clock(hr)*60+clock(min))
                        free all            1   patient        exitq       FIRST 1     move on
net1
 patient        SWS     inc swspats,1
                        swsavgwait = p(30,91)
                        wait swsavgwait
                        swstotalwait=(swstotalwait+swsavgwait)
                        swsperuse= (swstotalwait/5)/(clock(hr)*60+clock(min))

                        free all            1   patient        exitq       FIRST 1     move on
net1
 patient        ptot    inc ptotpats,1
                        ptavgwait = p(30,91)
                        wait ptavgwait
                        pttotalwait=(pttotalwait+ptavgwait)
                        ptperuse= (pttotalwait/5)/(clock(hr)*60+clock(min))

                        free all            1   patient        exitq       FIRST 1     move on
net1
 patient        exitq   wait p(60,93)
                        /*This placemarker simulates
                        useless time waiting, NOT provider
                        use time.*/         1   patient        exits       FIRST 1     move on
net1
 patient        exits   inc totalpats,1


                        if type() = 2 then inc type2
                        if type() = 3 then inc type3
                        if type() = 4 then inc type4
                        if type() = 5 then inc type5
                        if type() = 6 then inc type6
                        if type() = 7 then inc type7
                        if type() = 8 then inc type8


                                            1   patient        EXIT        FIRST 1     move on
net1
 dynamic_marker graph6  wait 1 hr
                        if track10<contents(graph6) then route 2
                        else route 1
                                            1   dynamic_marker graph6      CONTINUE 1
                                            2   dynamic_marker EXIT        FIRST 1
 dynamic_marker graph7  wait 1 hr
                        if track9<contents(graph7) then route 2
                        else route 1        1   dynamic_marker graph7      CONTINUE 1
                                            2   dynamic_marker EXIT        FIRST 1
 dynamic_marker graph8  wait 1 hr
                        if track8<contents(graph8) then route 2
                        else route 1        1   dynamic_marker graph8      CONTINUE 1
                                            2   dynamic_marker EXIT        FIRST 1
 dynamic_marker graph9  wait 1 hr
                        if track7<contents(graph9) then route 2
                        else route 1        1   dynamic_marker graph9      CONTINUE 1
                                            2   dynamic_marker EXIT        FIRST 1
 dynamic_marker graph10 wait 1 hr
                        if track6<contents(graph10) then route 2
                        else route 1        1   dynamic_marker graph10     CONTINUE 1
                                            2   dynamic_marker EXIT        FIRST 1
 dynamic_marker graph1  wait 1 hr
                        if track5<contents(graph1) then route 2
                        else route 1        1   dynamic_marker graph1      CONTINUE 1
                                            2   dynamic_marker EXIT        FIRST 1
 dynamic_marker graph2  wait 1 hr
                        if track4<contents(graph2) then route 2
                        else route 1        1   dynamic_marker graph2      CONTINUE 1
                                            2   dynamic_marker EXIT        FIRST 1
 dynamic_marker graph3  wait 1 hr
                        if track3<contents(graph3) then route 2
                        else route 1        1   dynamic_marker graph3      CONTINUE 1
                                            2   dynamic_marker EXIT        FIRST 1
 dynamic_marker graph4  wait 1 hr
                        if track2<contents(graph4) then route 2
                        else route 1        1   dynamic_marker graph4      CONTINUE 1
                                            2   dynamic_marker EXIT        FIRST 1
 dynamic_marker graph5  wait 1 hr
```

```
                        if track1<contents(graph5) then route 2
                        else route 1          1   dynamic_marker graph5      CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1
dynamic_marker graph11  wait 1 hr
                        if track15<contents(graph11) then route 2
                        else route 1          1   dynamic_marker graph11     CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1
dynamic_marker graph12  wait 1 hr
                        if track14<contents(graph12) then route 2
                        else route 1          1   dynamic_marker graph12     CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1
dynamic_marker graph13  wait 1 hr
                        if track13<contents(graph13) then route 2
                        else route 1          1   dynamic_marker graph13     CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1
dynamic_marker graph14  wait 1 hr
                        if track12<contents(graph14) then route 2
                        else route 1          1   dynamic_marker graph14     CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1
dynamic_marker graph15  wait 1 hr
                        if track11<contents(graph15) then route 2
                        else route 1          1   dynamic_marker graph15     CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1
dynamic_marker graph16  wait 1 hr
                        if track20<contents(graph16) then route 2
                        else route 1          1   dynamic_marker graph16     CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1
dynamic_marker graph17  wait 1 hr
                        if track19<contents(graph17) then route 2
                        else route 1          1   dynamic_marker graph17     CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1
dynamic_marker graph18  wait 1 hr
                        if track18<contents(graph18) then route 2
                        else route 1          1   dynamic_marker graph18     CONTINUE 1
dynamic_marker graph19  wait 1 hr
                        if track17<contents(graph19) then route 2
                        else route 1          1   dynamic_marker graph19     CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1
dynamic_marker graph20  wait 1 hr
                        if track16<contents(graph20) then route 2
                        else route 1          1   dynamic_marker graph20     CONTINUE 1
                                              2   dynamic_marker EXIT        FIRST 1

*****************************************************************************
*                                 Arrivals                                  *
*****************************************************************************

  Entity    Location   Qty each                                              First Time Occurrences
Frequency  Logic
  --------- ---------- ---------------------------------------------------- ---------- ----------
---------- ------------
  patient   entryctmc  entriesctmc; Cyc3                                    0          inf
24hr       /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed by

cycle.*/
  patient   entryfp    entriesfp; Cyc1                                      0          inf
24hr       /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed IAW

the patient templates of CHCS.*/
  patient   entrytmc4  U(17.9333, 17.9333,3); cyc2                          0          inf
24hr       /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed by
```

```
Poisson since the arrivals are not

scheduled.*/
  patient   entryer    35+W(2.44503, 39.891); cyc2                    0          inf
24 hr      /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed by

Poisson since the arrivals are not

scheduled.*/
  patient   entryobgyn W(7.80969, 53.5376,6); Cyc1                    0          inf
24hr
  patient   entrypeds  W(12.5988, 22.8961,7); Cyc1                    0          inf
24hr       /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed by

Poisson since the arrivals are not

scheduled.*/
  patient   entryim    W(8.14155, 58.0028,8); Cyc1                    0          inf
24hr       /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed by

Poisson since the arrivals are not

scheduled.*/
  patient   entrysds   W(10.2564, 31.3468,9); Cyc1                    0          inf
24hr       /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed by

Poisson since the arrivals are not

scheduled.*/
  patient   entryortho W(11.3802, 37.7333,10); Cyc1                   0          inf
24 hr      /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed by

Poisson since the arrivals are not

scheduled.*/
  patient   entrypsych P5(52.6853, 2836.29,11); Cyc1                  0          inf
24 hr      /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed by

Poisson since the arrivals are not

scheduled.*/
  patient   entrysws   W(5.26074, 34.2113,12); Cyc1                   0          inf
24 hr      /*The arrival distribution
```

```
is based on the distribution of the

average daily number

of visits per month distributed by

Poisson since the arrivals are not

scheduled.*/
  patient   entryptot  65.6486*(1./((1./U(0.5,0.5,13))-1.))**(1./16.5302); Cyc1 0          inf
24 hr      /*The arrival distribution

is based on the distribution of the

average daily number

of visits per month distributed by

Poisson since the arrivals are not

scheduled.*/
  hpnmarker entryhpn1  hpns*T(38, 76.9603, 79.3953); Cyc1                    0          inf
24 hr
  hpnmarker entryhpn2  hpns2*T(38, 76.9603, 79.3953); Cyc1                   0          inf
24 hr


*****************************************************************************
*                                Attributes                                 *
*****************************************************************************

  ID         Type         Classification
  ---------- ------------ --------------
#
#Basic patient types distributed according to CEIS (9 months of data).
  pttype     Integer      Entity


*****************************************************************************
*                             Variables (global)                            *
*****************************************************************************

  ID                       Type         Initial value                                          Stats
  ------------------------ ------------ ------------------------------------------------------ -----------
  ctmcpats                 Integer      0                                                      Time Series
  fpapats                  Integer      0                                                      Time Series
  tmc4pats                 Integer      0                                                      Time Series
  erpats                   Integer      0                                                      Time Series
  obpats                   Integer      0                                                      Time Series
  pedspats                 Integer      0                                                      Time Series
  impats                   Integer      0                                                      Time Series
  sdspats                  Integer      0                                                      Time Series
  totalpats                Integer      0                                                      Time Series
  totalcost                Real         0                                                      Time Series
  ctmccost                 Real         0                                                      Time Series
  fpcost                   Real         0                                                      Time Series
  tmc4cost                 Real         0                                                      Time Series
  ercost                   Real         0                                                      Time Series
  obcost                   Real         0                                                      Time Series
  pedscost                 Real         0                                                      Time Series
  imcost                   Real         0                                                      Time Series
  sdscost                  Real         0                                                      Time Series
  orthopats                Integer      0                                                      Time Series
  psychpats                Integer      0                                                      Time Series
  swspats                  Integer      0                                                      Time Series
  ptotpats                 Integer      0                                                      Time Series
  orthocost                Real         0                                                      Time Series
  psychcost                Real         0                                                      Time Series
  swscost                  Real         0                                                      Time Series
  ptotcost                 Real         0                                                      Time Series
#
#Based on 7000 initially assigned to the War Center and empiricial visits
  entriesctmc              Integer      83.8644*(1./((1./U(0.5,0.5,1))-1.))**(1./5.08453)      Time Series
#
#Based on population of 32000 less 7000 that get their care from War Center
 (RICMAS data)
  entriesfp                Integer      T(193, 285.152, 289.159,2)                             Time Series
  type1                    Integer      0                                                      Time Series
  type2                    Integer      0                                                      Time Series
  type3                    Integer      0                                                      Time Series
```

type4	Integer	0	Time Series
type5	Integer	0	Time Series
type6	Integer	0	Time Series
type7	Integer	0	Time Series
type8	Integer	0	Time Series
percentuse	Real	0	Time Series
ctmcavgdruse	Real	0	Time Series
ctmctotaldruse	Real	0	Time Series
fpavgdruse	Real	0	Time Series
fptotaldruse	Real	0	Time Series
tmc4avgdruse	Real	0	Time Series
tmc4totaldruse	Real	0	Time Series
eravgdruse	Real	0	Time Series
ertotaldruse	Real	0	Time Series
erpercentdruse	Real	0	Time Series
fppercentdruse	Real	0	Time Series
ctmcpercentdruse	Real	0	Time Series
tmc4percentdruse	Real	0	Time Series
obavgwait	Real	0	Time Series
obtotalwait	Real	0	Time Series
obperuse	Real	0	Time Series
pedsavgwait	Real	0	Time Series
pedstotalwait	Real	0	Time Series
pedsperuse	Real	0	Time Series
imavgwait	Real	0	Time Series
imtotalwait	Real	0	Time Series
imperuse	Real	0	Time Series
sdsavgwait	Real	0	Time Series
sdstotalwait	Real	0	Time Series
sdsperuse	Real	0	Time Series
orthoavgwait	Real	0	Time Series
orthototalwait	Real	0	Time Series
orthoperuse	Real	0	Time Series
psyavgwait	Real	0	Time Series
psytotalwait	Real	0	Time Series
psyperuse	Real	0	Time Series
swsavgwait	Real	0	Time Series
swstotalwait	Real	0	Time Series
swsperuse	Real	0	Time Series
ptavgwait	Real	0	Time Series
pttotalwait	Real	0	Time Series
ptperuse	Real	0	Time Series
ptperhour	Real	0	Time Series
zulu	Real	0	Time Series
cost_per_beneficiary	Real	0	Time Series
beneficiaries_assigned	Integer	32000	Time Series
ctmcdol_per_beneficiary	Real	0	Time Series
fpdol_per_beneficiary	Real	0	Time Series
tmc4_per_beneficiary	Real	0	Time Series
erdol_per_beneficiary	Real	0	Time Series
obgyndol_per_beneficiary	Real	0	Time Series
pedsdol_per_beneficiary	Real	0	Time Series
imdol_per_beneficiary	Real	0	Time Series
sdsdol_per_beneficiary	Real	0	Time Series
orthodol_per_beneficiary	Real	0	Time Series
psychdol_per_beneficiary	Real	0	Time Series
swsdol_per_beneficiary	Real	0	Time Series
ptotdol_per_beneficiary	Real	0	Time Series
assigned_to_warcenter	Integer	13545	Time Series
assigned_to_fp	Integer	0	Time Series
assigned_to_tmc4	Integer	6000	Time Series
alpha	Real	0	Time Series
bravo	Real	0	Time Series
charlie	Real	0	Time Series
delta	Real	0	Time Series
echo	Real	0	Time Series
foxtrot	Real	0	Time Series
golf	Real	0	Time Series
hotel	Real	0	Time Series
hpns	Real	2	Time Series
hpns2	Real	3	Time Series
warhpn	Integer	0	Time Series
fphpn	Integer	0	Time Series
entrieshpn1	Real	37.9296+P5(0.947229, 13.6702)	Time Series
entrieshpn2	Real	37.9296+P5(0.947229, 13.6702)	Time Series
india	Real	0	Time Series
juliet	Real	0	Time Series
kilo	Real	0	Time Series
lima	Real	0	Time Series
mike	Real	0	Time Series
november	Real	0	Time Series

oscar	Real	0	Time Series
papa	Real	0	Time Series
quebec	Real	0	Time Series
romeo	Real	0	Time Series
sierra	Real	0	Time Series
tango	Real	0	Time Series
uniform	Real	0	Time Series
victor	Real	0	Time Series
whiskey	Real	0	Time Series
xray	Real	0	Time Series
yankee	Real	0	Time Series
prevent	Real	.02	Time Series
hr_var	Integer	0	Time Series
min_var	Integer	0	Time Series
track1	Real	0	Time Series
track2	Real	0	Time Series
track3	Real	0	Time Series
track4	Real	0	Time Series
track5	Real	0	Time Series
track6	Integer	0	Time Series
track7	Integer	0	Time Series
track8	Integer	0	Time Series
track9	Integer	0	Time Series
track10	Integer	0	Time Series
track11	Integer	0	Time Series
track12	Integer	0	Time Series
track13	Integer	0	Time Series
track14	Integer	0	Time Series
track15	Integer	0	Time Series
track16	Integer	0	Time Series
track17	Integer	0	Time Series
track18	Integer	0	Time Series
track19	Integer	0	Time Series
track20	Integer	0	Time Series

****
* Macros *
****

ID	Text
fpmacro	
ctmcmacro	
ermacro	
hpn1macro	
hpn2macro	

****
* Subroutines *
****

ID	Type	Parameter	Type	Logic
interactive_sub_1	Interactive			#"Increase or decrease users at clinics"#
				prompt "How many additional users do you want to assign to the family practice clinic?", golf
				prompt "How many additional users do you want to assign to the WAR Center?", hotel
				assigned_to_warcenter = assigned_to_warcenter+hotel
				assigned_to_fp=assigned_to_fp+golf
				entriesctmc = entriesctmc*(assigned_to_warcenter/8000)
				entriesfp=entriesfp*((beneficiaries_assigned-assigned_to_warcenter)/24000)
costroutine	None			april:
				if clock(day) > 0 then cost_per_beneficiary=totalcost/beneficiaries_assigned/clock(day)
				if hr_var=0 and min_var = 0 then goto apricot
				if units(fpdr)-downqty(fpdr)>0 then mike=fpapats/(units(fpdr)-downqty(fpdr))/(clock(hr)-480) else mike = 0
				if units(ctmcdr)-downqty(ctmcdr)>0 then november=ctmcpats/(units(ctmcdr)-downqty(ctmcdr))/(clock(hr)-360) else november = 0
				if units (tmc4dr)-downqty(tmc4dr)>0 then oscar =tmc4pats/ (units(tmc4dr)-downqty(tmc4dr))/(clock(hr)) else oscar = 0
				papa=erpats/(units(erdr)-downqty(erdr))/(clock(hr))

```
                                                    if units(obdr)-downqty(obdr)>0 then quebec =
obpats/(units(obdr)-downqty(obdr))/(clock(hr)-480) else quebec = 0
                                                    if units(peddr)-downqty(peddr)>0 then romeo
=pedspats/ (units (peddr)-downqty(peddr))/(clock(hr)-480) else romeo = 0
                                                    if units(imdr) -downqty(imdr)>0 then sierra
=impats/ (units(imdr)-downqty(imdr))/(clock(hr)-480) else sierra = 0
                                                    if units (sdsdr)-downqty(sdsdr)>0 then
tango=sdspats/(units(sdsdr)-downqty(sdsdr))/(clock(hr)-480) else tango = 0
                                                    if units(orthodr)-downqty(orthodr)>0 then
uniform =orthopats/ (units(orthodr)-downqty(orthodr))/(clock(hr)-480) else uniform = 0
                                                    if units(psychdr)-downqty(psychdr)>0 then
victor =psychpats/(units(psychdr)-downqty(psychdr))/(clock(hr)-480) else victor = 0
                                                    if units(swsdr)-downqty(swsdr)>0 then
whiskey=swspats/(units(swsdr)-downqty(swsdr))/(clock(hr)-480) else whiskey = 0
                                                    if units(ptotdr)-downqty(ptotdr)>0 then
xray=ptotpats/ (units(ptotdr)-downqty(ptotdr))/(clock(hr)-480) else xray = 0
                                                    yankee = mike
+november+oscar+papa+quebec+romeo+sierra+tango+uniform+victor+whiskey+xray
                                                    ptperhour=yankee
                                                    wait 1 min
                                                    goto april

                                                    apricot:
                                                    wait 1 min
                                                    goto april


  costroutine2      None                            april2:
                                                    if hr_var=0 and min_var = 0 then goto april3
                                                    oscar =tmc4pats/ (units(tmc4dr)-
downqty(tmc4dr))/(clock(hr))
                                                    papa=erpats/(units(erdr)-
downqty(erdr))/(clock(hr))
                                                    ptperhour =oscar+papa

                                                    april3:
                                                    wait 1 min
                                                    goto april2
  percentusage      None                            effectop:

                                                    if hr_var=0 and min_var=0 then goto jones3
                                                    #tmc4 percent use#

tmc4percentdruse=tmc4totaldruse//((units(tmc4dr)-downqty(tmc4dr))*((clock(hr)))

                                                    #family practice percent use#
                                                    if units(fpdr)-downqty(fpdr)>0 then
fppercentdruse =  fptotaldruse/((units(fpdr)-downqty(fpdr))*((clock(hr)*60+clock(min)-480))) else
fppercentdruse = 0



                                                    #ctmc/WAR center percent use#
                                                    if units(ctmcdr)-downqty(ctmcdr)>0  then
ctmcpercentdruse = ctmctotaldruse/((units(ctmcdr)-downqty(ctmcdr))*((clock(hr)*60+clock(min)-360)))
else ctmcpercentdruse = 0


                                                    #er percent use#
                                                    erpercentdruse =ertotaldruse/((units(erdr)-
downqty(erdr))*((clock(hr)*60)))

                                                    #overall averaged percent use for primary
care#
                                                    if hr_var <6 then
                                                    {
                                                    percentuse = erpercentdruse
                                                    }
                                                    if hr_var >6<8 then
                                                    {
                                                    percentuse =(
ctmcpercentdruse+erpercentdruse)/2
                                                    }
                                                    if hr_var>8 then
                                                    {

percentuse=(ctmcpercentdruse+erpercentdruse+fppercentdruse)/3
                                                    }

                                                    jones3:
                                                    wait 1 min
```

```
clocks          None
```

```
arrivalgraph    None
```

```
contents(graph5) dynamic_marker to graph5
contents(graph4) dynamic_marker to graph4
contents(graph3) dynamic_marker to graph3
contents(graph2) dynamic_marker to graph2
contents(graph1) dynamic_marker to graph1
```

```
costperbenegraph  None
```

```
track6-contents(graph10) dynamic_marker to graph10
contents(graph9) dynamic_marker to graph9
contents(graph8) dynamic_marker to graph8
contents(graph7) dynamic_marker to graph7
track10-contents(graph6) dynamic_marker to graph6
```

```
patperhourgraph   None
```

```
track11-contents(graph15) dynamic_marker to graph15
track12-contents(graph14) dynamic_marker to graph14
track13-contents(graph13) dynamic_marker to graph13
track14-contents(graph12) dynamic_marker to graph12
track15-contents(graph11) dynamic_marker to graph11
```

```
costgraph         None
```

```
goto effectop
backups:
hr_var = 0
while hr_var < 24
do
 {
 min_var=0
 while min_var<60
 do
         {
         wait 1min
         inc min_var,1
         }
 inc hr_var, 1
 }


goto backups

jones:
 track5=track4
 track4 = track3
 track3=track2
 track2 = track1
 track1 = percentuse*100
if track1>contents(graph5) then order track1-

if track2>contents(graph4) then order track2-

if track3>contents(graph3) then order track3-

if track4>contents(graph2) then order track4-

if track5>contents(graph1) then order track5-


wait 1 hr
goto jones
jones2:
 track10=track9
 track9 = track8
 track8=track7
 track7 = track6
 track6 = cost_per_beneficiary*100

if track6>contents(graph10) then order

if track7>contents(graph9) then order track7-

if track8>contents(graph8) then order track8-

if track9>contents(graph7) then order track9-

if track10>contents(graph6) then order

wait 1 hr
goto jones2
jones4:
 track15=track14
 track14 = track13
 track13=track12
 track12 = track11
 track11 = ptperhour

if track11>contents(graph15) then order

if track12>contents(graph14) then order

if track13>contents(graph13) then order

if track14>contents(graph12) then order

if track15>contents(graph11) then order

wait 1 hr
goto jones4
jones5:
 track20=track19
 track19 = track18
 track18=track17
```

```
track16-contents(graph20) dynamic_marker to graph20

track17-contents(graph19) dynamic_marker to graph19

track18-contents(graph18) dynamic_marker to graph18

track19-contents(graph17) dynamic_marker to graph17

track20-contents(graph16) dynamic_marker to graph16
```

reports	None

```
track17 = track16
track16 =totalcost/1000

if track16>contents(graph20) then order

if track17>contents(graph19) then order

if track18>contents(graph18) then order

if track19>contents(graph17) then order

if track20>contents(graph16) then order

wait 1 hr
goto jones5
jones6:
writeline(report1, percentuse)


wait 1 hr
goto jones6
```

Arrival Cycles

ID	Qty / %	Cumulative	Time (Hours)	Value
Cyc1	Percent	Yes	8 hr	0
			8.5 hr	20
			9 hr	30
			9.5 hr	40
			10 hr	50
			10.5 hr	55
			11hr	60
			11.5hr	65
			12hr	67.5
			12.5hr	70
			13hr	75
			13.5hr	80
			14hr	85
			14.5	90
			15	95
			15.5	100
cyc2	Percent	Yes	0	2
			1	4
			2	6
			3	8
			4	10
			5	12
			6	14
			7	20
			8	30
			9	40
			10	50
			11	55
			12	60
			13	65
			14	70
			15	75
			16	80
			17	85
			18	90
			19	92
			20	94
			21	96
			22	98
			23	99
			24	100
Cyc3	Percent	Yes	6	0
			6.5	15
			8	25
			9	40
			10	50
			11	55
			12	60
			13	70
			14	80
			15	85

```
                                    16          95
                                    17          100

*****************************************************************************
*                              Table Functions                              *
*****************************************************************************

  ID                Independent Value Dependent Value
  ----------------- ----------------- ---------------
  costforwarcenter  0-50              110
                    50-100            100
                    100-150           90
                    150-200           80
                    200-250           90
  costforfp         0-100             120
                    100-150           110
                    150-200           100
                    200-250           90
                    250-300           100


*****************************************************************************
*                             User Distributions                            *
*****************************************************************************

  ID          Type          Cumulative   Percentage   Value
  ----------- ------------ ------------ ------------ ------------
  type        Discrete      No           26.38        1
                                         7.31         2
                                         45.23        3
                                         10.33        4
                                         1.39         5
                                         1.67         6
                                         2.14         7
                                         5.55         8


*****************************************************************************
*                               External Files                              *
*****************************************************************************

  ID          Type                File Name                          Prompt
  ----------- ------------------ ---------------------------------- ----------
#
#report
  report1     General Write      C:\medmod3\output\percent_use.txt
```

Appendix P - t-Test Analyses

Family Practice Visits t-Test		
	Variable 1	*Variable 2*
Mean	250.19	250.33
Variance	707.82	
Observations	24.00	1
Pooled Variance	707.82	
Ho	0.00	
df	23.00	
t Stat	-0.01	
P(T<=t) one-tail	0.50	
t Critical one-tail	1.71	
P(T<=t) two-tail	**.99**	
t Critical two-tail	2.07	

Family Practice Cost per Visit t-Test		
	Variable 1	*Variable 2*
Mean	96.49	100.85
Variance	330.16	
Observations	12.00	1.00
Pooled Variance	330.16	
Ho	0.00	
df	11.00	
t Stat	-0.23	
P(T<=t) one-tail	0.41	
t Critical one-tail	1.80	
P(T<=t) two-tail	**0.82**	
t Critical two-tail	2.20	

Average Patient Wait Time t-Test		
	Variable 1	*Variable 2*
Mean	23.13	30.1056
Variance	234.90	
Observations	24.00	1
Pooled Variance	234.90	
Ho	0.00	
df	23.00	
t Stat	-0.45	
P(T<=t) one-tail	0.33	
t Critical one-tail	1.71	
P(T<=t) two-tail	**0.66**	
t Critical two-tail	2.07	

ER Visits t-Test		
	Variable 1	*Variable 2*
Mean	70.72	65.57
Variance	242.02	
Observations	23.00	1.00
Pooled Variance	242.02	
Ho	0.00	
df	22.00	
t Stat	0.32	
P(T<=t) one-tail	0.37	
t Critical one-tail	1.72	
P(T<=t) two-tail	**0.75**	
t Critical two-tail	2.07	

TMC Cost per Visit t-Test		
	Variable 1	*Variable 2*
Mean	96.49	91.41
Variance	330.16	
Observations	12.00	1.00
Pooled Variance	330.16	
Ho	0.00	
df	11.00	
t Stat	0.27	
P(T<=t) one-tail	0.40	
t Critical one-tail	1.80	
P(T<=t) two-tail	**0.79**	
t Critical two-tail	2.20	

CTMC Visits t-Test		
	Variable 1	*Variable 2*
Mean	86.82	81.70
Variance	738.73	
Observations	24.00	1.00
Pooled Variance	738.73	
Ho	0.00	
df	23.00	
t Stat	0.18	
P(T<=t) one-tail	0.43	
t Critical one-tail	1.71	
P(T<=t) two-tail	**0.86**	
t Critical two-tail	2.07	

ER Cost per Visit t-Test		
	Variable 1	*Variable 2*
Mean	200.64	177.59
Variance	1615.40	
Observations	12.00	1.00
Pooled Variance	1615.40	
Ho	0.00	
df	11.00	
t Stat	0.55	
P(T<=t) one-tail	0.30	
t Critical one-tail	1.80	
P(T<=t) two-tail	**0.59**	
t Critical two-tail	2.20	

References

Austin Regional Clinic [On-Line] (1998). Available: http://www.austinregionalclinic.com/index.html.

Army Medicine [On-Line] (1997). Available: http://www.armymedicine.army.mil/armymed/index.htm

American Hospital Directory [On-Line] (1997). Available: http://www.ahd.com

Bayne-Jones Army Community Hospital Wellness and Readiness Web Site [On-Line] (1997). Available: http://bjach.polk.amedd.army.mil or http://www.polk.amedd.army.mil .

Battle-focused training (1993). Army Field Manual 25-101.

Blanck, Ronald R. (1997). Surgeon general plans for the future. U.S. Medicine [On-line] Available: http://www.usmedicine.com/futur.html.

Collins, James C. and Porras Jerry I (1991). Organizational vision and visionary organizations. California Management Review, 34, 1, pp. 30-52.

Cummings, Thomas and Huse, Edgar F. (1989). Organization development and change, 4th Edition. St. Paul: West Publishing.

Department of Defense Network Information Center [On-Line] (1998). Available: http://www.nic.mil.

Duncan, Jack W.; Ginter, Peter M.; and Swayne, Linda E (1995). Strategic management of health care organizations, 2d Edition. Cambridge, MA: Blackwell Publishers.

Emory, William C. and Cooper, Donald R. (1991). Business research methods, 4th Edition. Homewood, IL: Irwin.

Feldstein, J. (1991). The economics of health and medical care, 3d Edition. Gaithersburg, MD: Aspen, p. 134.

Finkler, S. (1994). Essentials of cost accounting for health care organizations. Gaithersburg, MD: Aspen, pp. 23-35.

Finstuen, K (1997). Ten-Step Method. Unpublished manuscript.

Fort Polk Facts [On-Line] (1997). Available: http://www.jrtc-polk.army.mil/facts.htm

Gapenski, L (1996). Understanding health care financial management, 2d edition. Chicago: Health Administration Press, p. 799.

Goldstein, D. (May 1998). Using the internet to improve customer service. Healthcare informatics, p. 23.

Griffith, J. (1995). The well-managed health care organization, 3d edition. Ann Arbor: Health Administration Press, p.374.

Institute for Spinal Disorders [On-Line] (1998). Available: http://www.spines.com/Institute/online.htm.

Ivancevich, J. and Matteson, M. (1997). Organizational behavior and management, 4th edition. Chicago: Irwin.

Joint Readiness Training Center and Fort Polk Home Page, [On-Line] (1997). Available: http://www.jrtc-polk.army.mil.

Kongstvedt, P. (1997). The managed care handbooke, 3d edition. Gaithersburg, MD: Aspen, p. 563.

Law, Averill M. and Kelton, W. David (1991). Simulation modeling and analysis, 2d Edition. New York: McGraw-Hill, Inc., pg. 299.

Lazarus, I. and Silverstien, S. (June, 1996). Personal health management. Managed health care, 6, pp. 43-46.

Lotfi, V. and Pegels, C. (1997). Decision support systems for operations management and management science (3d edition). Chicago: Irwin. pg. 79.

Lowery, J. C. (1993). Multi-hospital validation of critical care simulation model. Proceedings of the 1993 Winter Simulation Conference, pg. 1209.

LPXMED-External Logistics Processor, Medical [On-Line] (1997). Available: http://hp01.arc.iquest.com/j_8/lpxmed.html

MedModel® [On-Line] (1997). Available: http://www.MedModel®.com/wwwww.html

MedModel® User's Guide (1996). Utah: ProModel Corporation.

Operations Research in Theater Medical Modeling [On-Line] (1997). Available: http://www.informs.org/Conf/SD97/TALKS/MB31.html

Organizational Modeling [On-Line] (1997). Available: http://raider.mgmt.purdue.edu/~alokrc/joy/wtk.html

Peters, Tom (1988). Thriving on chaos. New York: Alfred A. Knopf, pp. 401-404.

Rockart, John (1982). The changing role of the information systems executive: a critical success factors perspective. Sloan management review, 24, pp. 3-14.

Smith, P.C.; Kendall, L.M., and Hulin, C. L. (1969) The measurement of satisfaction in work and retirement. Skokie, IL: Rand McNally.

Stuart, A.; and Ord, J. (1991). Kendall's advanced theory of statistics, volume 2. Oxford: London, p. 1159.

Table of Distribution and Allowance MCW2NKAA, Effective Date 980601.

Tiger census map server [On-Line] (1997). Available: http://tiger.census.gov

Training the force (1988). Army Field Manual 25-100.

Tushman, M.; Newman, W.; and Romanelli, E. (Fall, 1986). Managing the unsteady pace of organizational revolution. California management review, pp. 29-44.

Vestal, K; Fralicx, R. and Spreier, S. (Fall, 1997). Organizational culture: the critical link between strategy and results. Hospital and health services administration, 42, 339-365.

Williams, S. and Torrens, P. (1993). Introduction to health services, 4th edition. New York: Delmar.